The purpose of this manual is to provide information about daily operations of the Palmetto Health Richland Laboratory Services. The laboratory computer system is interfaced with the hospital computer system. This manual is also located on PHANET MyPal/myCampus/Richland/Laboratory Services//Laboratory Manual/Hospital Lab Information. Test Information can be accessed by choosing the beginning letter of the test name on the Laboratory Test Directory keypad on the top left of the Palmetto Health Richland Laboratory Home Page.

When the hospital computer system is not functioning, written “backup” tickets must be sent to the laboratory for processing. Refer to computer downtime procedures in this manual.

Blood and replaceable fluids may be transported to the lab via pneumatic carriers lined with foam inserts following lab protocol (Refer to Appendix). Fluids that are considered non-replaceable (example: spinal fluid, pleural fluids etc) cannot be sent through the pneumatic tube system. They must be brought to the Core lab and logged into the fluid book in the Hematology section. Black carriers should not be used for transport of blood and/or body fluids.

The laboratory staff will be happy to answer any questions regarding services offered.

Paul L. Guerry, M.D.
Professional Director of Laboratories

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Administrative Director of Laboratory Services

Fay Parker-Brown, MBA, MT, (ASCP) SM
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Laboratory Manager
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PATHOLOGY DEPARTMENT ORGANIZATION

The Department of Anatomical and Clinical Pathology of Palmetto Health Richland provides pathological investigations and clinical laboratory tests for hospital patients, private outpatients, and Ambulatory Care Center patients.

The Anatomical Pathology Department is composed of Histology (Surgical Pathology), and the Autopsy Service. For general information, call extension 6405.

The Clinical Pathology Department is composed of Specimen Processing, Blood Bank, Core Lab: (Hematology, Coagulation, Chemistry, Urinalysis, Immunology), Microbiology/Parasitology, Molecular Pathology, Reference Lab (Send Out), ER Laboratory, and the Ambulatory Care Center. For general information, call extension 7770.

PROFESSIONAL DIRECTOR OF PATHOLOGY SERVICES
Paul L. Guerry, MD Medical Director

PATHOLOGISTS
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QUALITY ASSURANCE/INFORMATION COORDINATOR
Karen W. Sullivan, BS, MT (ASCP)

Departments
ACC Laboratory Karen W. Sullivan, BS, MT (ASCP)
Blood Bank
Sendouts
Lab Front Office/Outreach
Histology
Microbiology/Mycobacteriology/
Parasitology/Mycology
Molecular Pathology/Flow Lab
Core Laboratory
Chemistry Supervisor
Hematology/ UA/Coag Supervisor
Immunology/ER Lab Supervisor
Specimen Processing/Procurement/
Phlebotomy Supervisor
Point of Care Testing
Pathology
Outreach
IT Support
Phlebotomy Supervisor
Courier Supervisor
LIS analyst
Administrative Coordinator
MT Program Director
Weekends/Holidays

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Christy Knight, BS, MT (ASCP) SC
Ext. 7770

LABORATORY HOURS OF OPERATION

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<td>7:30AM-6:00PM (Mon-Fri)</td>
</tr>
<tr>
<td>Autopsy</td>
<td>8:30AM-4:00PM (on call evenings/weekends)</td>
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<tr>
<td>Blood Bank</td>
<td>24hr. coverage</td>
</tr>
<tr>
<td>Histology</td>
<td>7:30AM-5:00PM (Mon-Fri)</td>
</tr>
<tr>
<td></td>
<td>(Frozens til 5:00 PM &amp; on call evenings/weekends)</td>
</tr>
<tr>
<td>Immunology/Serology</td>
<td>7:00AM- 2:00 PM (Mon-Sun)</td>
</tr>
<tr>
<td>Microbiology/Mycobacteriology/</td>
<td>24hr. coverage</td>
</tr>
<tr>
<td>Parasitology/Mycology</td>
<td></td>
</tr>
<tr>
<td>Core Lab Chemistry, Hematology</td>
<td>24hr. coverage</td>
</tr>
<tr>
<td>Uranalysis, ER Lab</td>
<td></td>
</tr>
<tr>
<td>ACC</td>
<td>8:30AM-5:00PM (Mon-Fri)</td>
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<tr>
<td>Reference Lab</td>
<td>8:00AM-4:30PM (Mon-Fri)</td>
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<td></td>
<td>9:00AM-1:00PM (Sat.)</td>
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<tr>
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<td>Closed Sundays and Hospital Holidays</td>
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<td></td>
<td>Closed Sunday</td>
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</table>
ANATOMIC PATHOLOGY HOURS OF OPERATION

HISTOLOGY/SURGICAL PATHOLOGY

Routine Hours
Routine Hours of Operation are from 7:30AM to 5:00PM, Monday through Friday. In general, specimens received by 4:30 PM, Monday through Thursday will be examined grossly on the day received, processed overnight, and have sections available for interpretation on the following day. Specimens received on Friday by 4:30 PM will be processed over the weekend and sections will be available for interpretation the following Monday. Certain specimens received on Friday deemed essential for earlier processing by special request (RUSH) or at the option of the pathologist may be processed Friday night and have section available for interpretation on Saturday.

Specimens received in the laboratory on weekends will be processed on Monday and sections will be available for interpretations on Tuesday. Specimens received on holidays will be processed the day following the holiday unless the holiday precedes a weekend. Generally, there will be a one-day delay due to any holiday falling on the usual work days (Monday through Thursday).

Routine Sections
Pathology should be notified when a frozen section is obtained between the hours of 7:30AM and 6:00PM, Monday through Friday (ext. 6405). If there is a need for a frozen section after 6:00PM or on weekends or holidays, please call the laboratory charge tech so that he/she can notify the pathologist-on-call (ext. 7471). After 6:00PM, a pathologist may not be physically present in the department. Therefore, some delay must be expected for his/her arrival.

Biopsies of Lymph Nodes, Spleen, and Other RES Tissues
Diagnostic lymph node biopsies, spleen and other RES tissue, are examined fresh between the hours of 7:30AM and 6:00PM, Monday through Friday. After 6:00PM and on weekends and holidays, call the laboratory (ext. 7471) and inform the laboratory charge tech so that he/she can notify the pathologist-on-call.

CYTOLOGY
Specimens for cytology are sent to a reference lab by the specimen processing area. All specimens should be brought directly to the specimen processing area, unless it is a fluid or bronchial washing (then it should go to Core Lab first and be signed in the book.

AUTOPSY
When definite autopsy permission has been obtained and is in the proper order, notify the Pathology Department in the following manner.

1. Monday through Friday from 7:30AM to 6:00PM, call ext. 6405 to notify the Pathology Office that the autopsy permission has been obtained.

   Immediately bring the autopsy consent form and the patient’s chart to the Pathology Department.*

2. From 6:00PM to 7:30AM and on weekends and holidays, call the laboratory (ext. 7471) and
notify the charge tech that the autopsy consent form has been obtained. Immediately bring the autopsy consent form and the patient’s chart to the laboratory and deliver it to the charge tech who will notify the pathologist on call.

3. The actual time of performance of an autopsy depends upon scheduling and is at the discretion of the prosector (pathologist).

Usually, no autopsies are begun after 4:00PM; therefore, if all paperwork is not in order and the body is not in the morgue prior to 4:00PM, the autopsy may be delayed until the following morning.

NOTE: Additional information concerning Histology (Surgical Pathology), Cytology and Autopsy Service may be found in this manual under the listing of Anatomic Pathology Section Guidelines.

*If Pathology Office personnel have gone for the day, follow procedure #2 above.

ANATOMICAL PATHOLOGY SECTION GUIDELINES

HISTOLOGY (SURGICAL PATHOLOGY)

Pathological Examination
Requests for pathological examinations should contain the patient’s name, age, race, sex social security number, unit record number and billing number, insurance information (patient’s address if outpatient), physician’s name, source of specimen, post-op diagnosis, and clinical data. See Appendix, page 1 for example of completed form.

Abortions and products of conception should also have the last menstrual period, if known, included in the clinical data section of the requisition.

Specimens received by 4:30PM Monday through Thursday, will be examined grossly on the day received, processed overnight, and have sections available for interpretation the following day.

Specimens received on Friday by 4:30PM will be processed over the weekend and sections will be available for interpretation the following Monday. Certain specimens received on Friday and deemed essential for earlier processing by special request (RUSH) or at the option of the pathologist, may be processed Friday night with sections available for interpretation on Saturday. [Note: There will be an additional charge for any specimen requested RUSH.]
Small specimens received by 8AM will be ran on short cycle and may be ready by that afternoon.

Specimens received in the laboratory on weekends will be processed on Monday and sections will be available for interpretation on Tuesday. Specimens received on holidays will be processed the day following the holiday unless the holiday precedes a weekend. Generally, there will be a one-day delay due to any holiday falling on the usual work days (Monday through Friday).

Preparations of Specimens
1. Specimen containers and pathology requisitions should be labeled with the patient’s names, unit record number, billing number, physician name, date and identification of contents.
2. The pathologist on call should be consulted when any fresh unixed specimen comes to the lab.

3. Specimens (not for frozen sections) should be completely covered with 10% formalin fixative as soon as possible. At least nine (9) volumes of formalin per one unit of specimen should be used.

   NOTE: Formalin is available from the Histology Section (ext. 6710) or Morgue (ext. 2285). If formalin is not available, contact Histology.

4. Air drying of specimens prevents proper processing and accurate diagnosis. This is especially true of placenta. **DO NOT ALLOW PLACENTA TO REMAIN UNFIXED.** Autolysis occurs at a very rapid rate.

5. **MUSCLE BIOPSIES** should be obtained in a muscle clamp available in the O.R. or submitted held by muscle biopsy forceps. The specimen should be sent immediately to the laboratory **WITHOUT FIXATIVE.** Call Histology (ext. 6710) one day in advance of performing a muscle biopsy.

6. Specimens that require **BACTERIAL CULTURES** must be collected in a sterile container. These specimens should not be covered with any fixative until smears and/or cultures are taken.

7. Specimens for **FROZEN SECTION** should be submitted **WITHOUT** fixative and brought immediately to the Histology Section. (Pathology ext. 6405) should be notified when a frozen section is obtained between the hours of 7:30AM and 6:00PM, Monday through Friday. If there is a request for a frozen section after 6:00PM or on weekends or holidays, please call the laboratory (ext 7471) and inform the charge tech so that he/she can notify the pathologist-on-call. After 6:00PM, a pathologist may not be physically present in the department. Therefore, some delay must be expected for his/her arrival.

8. **DIAGNOSTIC LYMPH NODES** as well as **SPLEEN** and other **RES** tissues are examined fresh between the hours of 7:30AM and 6:00PM, Monday through Friday. After 6:00PM and on weekends and holidays, call the laboratory (ext 7471) and inform the charge tech so that he/she can notify the pathologist-on-call. These specimens should be submitted **WITHOUT** fixative.

9. Specimens for **ESTROGEN RECEPTOR ASSAY** should be treated as frozen section.

10. For all **MASTECTOMY SPECIMENS FOR BREAST CANCER,** forms designated Palmetto Richland Memorial Hospital Surgery Data Form for Cancer Staging and Pathology Data Form for Cancer Staging are to be filled out. The form entitled **Surgery Data Form for Cancer Staging (Form No. 74-2070-6)** is to be filled out by the pathologist responsible for the pathology report or protocol. In addition, a copy of this form is forwarded to the Tumor Registry for their files and records.

11. **RENAI BIOPSIES** should be scheduled with the Histology Section (ext. 6710). As soon as possible the histologist will be available to assist or give instructions for special handling.

12. After 5:00PM, all specimens for Histology must be delivered to the Stat Laboratory. Information concerning the specimen must be entered in the correct log book by the person
delivering the specimen. This information will be checked and signed by a laboratory technologist while the nursing personnel is still in the department.

13. Be certain that all specimens are placed immediately in the proper fixative unless special handling is requested by the attending physician. If there are any questions concerning any of these procedures, please ask the attending physician or call the Histology Department (ext. 6710) for advice.

ANATOMIC PATHOLOGY REQUEST FORMS

SPECIMEN EXCEPTIONS/REQUEST FORMS FOR SUBMISSION TO PATHOLOGY

HISTOLOGY (Surgical Pathology Requisition: #75-1417)

A typewriter or black ballpoint pen should be used for completing the form. If using a pen, USE PRESSURE, since there are several copies that must be legible after separation of the form. If any of the basic information is not present on the Surgical Pathology Requisition or if it is illegible, the requisition will be returned for clarification of the missing or illegible items.

All specimens must be accompanied by the Surgical Pathology Requisition, properly completed, and brought to the Histology Section (ext. 6710, 2284).

All “RUSH” requests are brought to the attention of one of the histologists (ext. 6710, 2284).

For Inpatients, Fill in the Form as Follows

1. Enter patient’s name, unit record number, account number, date of birth, sex, social security number, and race in space labeled NAME/ADDRESS using the patient’s addressograph plate.

2. Enter date specimen obtained in the space labeled DATE OF SURGERY.

3. Enter place (e.g., OR, ER Nursing Unit, etc) from which the specimen originated in space labeled ADDRESS/LOCATION.

4. Enter specimen identification (e.g. node, appendix, spleen, etc) in space labeled SPECIMEN (SOURCE).

5. Enter specimen identification (e.g., node, appendix, spleen, etc.) in space labeled SPECIMEN (SOURCE).

6. Enter pertinent postoperative diagnosis/clinical data in space labeled RELEVANT CLINICAL INFORMATION AND/OR DIAGNOSIS.

7. Place an “X” in the appropriate box to indicate FROZEN or ROUTINE handling of the specimen.
For Outpatients Fill in the Form as Follows

1. Enter patient’s name, unit record number, social security and account number in space labeled NAME/ADDRESS for all hospital outpatients using the patient’s addressograph.

2. Type or print patient’s name and address in space labeled NAME/ADDRESS for all outpatients from private physicians’ offices.

3. Enter place (e.g., FP, Clinic, Physician’s Office, etc.) from which the specimen originated in the space labeled ADDRESS/LOCATION.

4. Enter name of physician performing surgical procedure in space labeled REQUESTING PHYSICIAN. THE ATTENDING PHYSICIAN’S NAME MUST BE PROVIDED WITH A RESIDENT’S NAME.

5. Enter the date the specimen was obtained in space labeled DATE OF SURGERY.

6. Enter specimen identification (e.g., skin lesion, cervical biopsy, etc.) In space labeled SPECIMEN (SOURCE).

7. Enter any pertinent clinical information and/or post op diagnosis in space labeled RELEVANT CLINICAL INFORMATION AND/OR DIAGNOSIS.

8. Place an “X” in the appropriate box to designate ROUTINE or FROZEN handling of the specimen.

9. Enter COMPLETE billing (to include insurance information) information.

10. An ICD-9 Code must be submitted on a Pathology Form to avoid delay in specimen processing.
AUTOPSY

Transfer of Body to Morgue
1. When an Autopsy Consent Form has been secured with signed legal permission, the body should be labeled “FOR AUTOPSY” and transferred to the morgue in the usual manner as soon as possible.

2. When an autopsy is pending, the body should be labeled “POSSIBLE AUTOPSY” and transferred to the morgue in the usual manner as soon as possible.

3. If deceased is known to have serious infection, such as hepatitis, tuberculosis, AIDS, etc. label as “CONTAMINATED”.

Notification to Pathology Department of Autopsy
1. Autopsy Consent Form (#75-0090) must be properly completed. In order for the Autopsy Consent Form to be legal, it must be signed by the next of kin *and two witnesses. It is also essential to indicate whether or not there are any RESTRICTIONS by checking either “none”, one of the designated organs, or “other” and listing what other restrictions.

NOTE: *Signing as Next of Kin Must Be:
a) BOTH parents if examination of stillborn or infant (BOTH grandparents if mother is unmarried minor); b) BOTH parents if examination of minor; c) Spouse if married (or legal guardian, or person(s) responsible for hospital/funeral arrangements).

2. From 7:30AM to 6:00PM, notify pathology (ext. 6405) that an Autopsy Consent Form has been obtained.

3. Immediately bring the Autopsy Consent Form and patient’s chart to the Pathology Office.

4. From 6:00PM to 7:30AM and on weekends and holidays, call the laboratory (ext. 7471) and notify the charge tech that the Autopsy Consent Form has been obtained. Immediately bring Autopsy Consent Form and patient’s chart to laboratory and deliver to charge tech. The charge tech will notify the pathologist-on-call.

5. When an autopsy is to be performed on a fetus for which one or both of the parents want the hospital to take responsibility of disposal, the Disposal of Fetus Permit (Form #74-0360-7) must accompany the Autopsy Consent Form and mother’s chart to the Pathology Department.

6. NO AUTOPSY REPORT IS ISSUED TO THE FAMILY BY THE PATHOLOGY DEPARTMENT. A copy of an autopsy report may be secured from Medical Records or the Attending Physician.

7. Autopsies performed every day of the week including holidays during daytime hours.

Notification of Security
1. When autopsies are completed, designated Pathology personnel fills out release form 75-0091-2 and notifies hospital Security. Security is responsible for releasing body to
appropriate party.

2. For disposal of fetus from autopsy, Security calls Pathology to inquire if autopsy or surgical is completed.

**Gross Dissection**

Actual performance of the autopsy and the responsibility for recording of tentative and final interpretation rests with the pathologist who functions as the prosector. Portions of the gross dissection and certain ancillary procedures may be delegated to and carried out by the pathology assistant under the guidance and supervision of the pathologist.

The extent of the anatomical dissection may vary from case to case depending upon the limitations of the autopsy permit, if any, nature of the clinical situation, and suspected or actual gross findings. Decisions relative to the extent of dissection are left to the judgment of the pathologist performing the autopsy.

In most cases, when no limitations of consent exist, a complete autopsy is performed which includes examination of the organs of the neck thorax, abdomen, and pelvis and removal of the brain.

**Tissue removed and Sampled at Autopsy**

All gross unfixed tissues remaining after appropriate sampling for histological examination, etc. are placed in a red plastic bag, sealed and returned with the body. These organs and tissues are taken with the body to the funeral home. Otherwise, unfixed tissues are incinerated by the hospital Environmental Services.

At the time of gross dissection, appropriate gross material is removed and kept for approximately one year. The actual amount of tissue saved or retained in this manner will depend on the suspected or actual findings at the time of the autopsy. Representative tissue from all organs examined should be included in this specimen container. Organs may be saved for diagnostic or teaching purposes indefinitely.

From the material retained, tissue sections for histology are prepared and processed. The number of sections required or submitted in each case will vary depending on the findings or suspected findings and the custom in performance of the pathologist. However, in practically every case, sections from all major viscera are submitted even if they are grossly normal. In general, all significant gross observations are documented or represented by a histological section. Fixed gross material is retained for one year, unless portions or all are felt to be useful for diagnostic or teaching purposes.
**Written Autopsy Protocol**

Within one working day following completion of the gross dissection, the Provisional Anatomical Diagnosis, based on gross observations, is rendered and sent to the Attending Physician and to the Medical Records Department for inclusion in the permanent record of the deceased.

The basic final autopsy report will contain the following elements:

1. Name of the deceased, unit record #, date and time of death, date and time of autopsy, autopsy number, prosector’s name, attending physician’s name.
2. Gross description (external, internal [upon opening], description of organ systems or individual organs).
3. Provisional Anatomical (PAD).
4. Description of microscopic slides.
5. Final Anatomical Diagnoses.
6. Final note or summary of pertinent findings (optional).

The style and format may vary somewhat in individual cases, and may vary relative to the custom and preference of the prosector.

**CYTOLOGY**

All specimens for cytology are sent to a reference lab. All Non-Gyn specimens should be taken immediately to the Fluids area of Hematology. GYN specimens can be taken to Specimen Processing.

An example of the cytology form can be found in the Appendix, page 4 of this manual. Information/instructions on how to complete the form can be obtained from the Sendout dept. at x7609 or the Specimen Processing Department at x4650.

The following is a list of cytology tests that can be performed. See Alphabetical Listing of Tests for information concerning these tests.

**TESTS**

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<th>Gastric Washing</th>
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</thead>
<tbody>
<tr>
<td>Aspirations</td>
<td>Misc. fluids (must list source)</td>
</tr>
<tr>
<td>Breast Smears</td>
<td>Needle Biopsies</td>
</tr>
<tr>
<td>Bronchial Washings</td>
<td>Peritoneal Fluid</td>
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<tr>
<td>Brushings</td>
<td>Pleural Fluid</td>
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<tr>
<td>Buccal Smears for Barr Bodies</td>
<td>Spinal Fluid</td>
</tr>
<tr>
<td>Esophageal Brush</td>
<td>Sputum</td>
</tr>
<tr>
<td>Esophageal Washing</td>
<td>Thyroids</td>
</tr>
<tr>
<td>Fluid Cysts</td>
<td>Urines</td>
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<tr>
<td>Gastric Brush</td>
<td></td>
</tr>
</tbody>
</table>
NON-GYN CYTOLOGY: PLEASE ORDER # 15900 IN HBO. Completed form MUST accompany the specimen before it can be sent to reference lab.

PLEASE REFERENCE PAP SMEARS FOR ORDERING INFORMATION ON GYN CYTOLOGY.

For Inpatients Fill in the Forms as Follows:

1. Enter the patient’s name, address, unit record number, billing number, age, and room number in spaces labeled NAME AND ADDRESS using the patient’s addressograph plate.
2. Enter the name of the physician ordering the test in the space labeled REQUESTING PHYSICIAN.
3. Enter date specimen was collected in space labeled ORDERS/SAMPLE DATE.
4. Enter any pertinent information in space labeled RELEVANT CLINICAL INFORMATION AND/OR DIAGNOSIS.
5. For pap smears fill in appropriate spaces concerning patient’s history in spaces labeled: AGE, LMP, PREGNANT, POSTPARTUM-WKS, POSTMENOPAUSAL-YRS., EXOGENOUS ESTROGENS, EXOGENOUS PROGESTERONE, IUD, PREVIOUS PAP (results and cytology number), PREVIOUS BIOPSY (results and pathology number), PREVIOUS X-RAY THERAPY (when completed). Indicate area from which smears were taken by placing an “X” in the appropriate space beside SMEARS TAKEN FROM.
6. For Non-Genital Cytology check the correct box to indicate SOURCE OF SPECIMEN.
7. Use a typewriter or black ball point pen to complete the form. If writing, USE PRESSURE and write legibly since there are several copies which must be legible after separation of the form.

For Outpatients Fill in the Form as Follows

1. Enter patient’s name in space labeled NAME.
2. Enter patient’s address in space labeled ADDRESS.
3. Enter COMPLETE billing information.
4. Fill out remainder of information as described for inpatients listed above.
CLINICAL LABORATORY HOURS OF OPERATION

The Clinical Laboratory includes Core Lab (Hematology/Coagulation/Urinalysis/Chemistry/Immunology), Specimen Processing, Microbiology/Parasitology, ACC Lab, ER Lab, Molecular Pathology, Blood Bank and Reference Lab.

Routine Hours
The routine hours of operation of the Clinical Laboratory are from 7:00AM to 3:30PM Daily

During this time the laboratory is in full operation for ROUTINE, TIMED, ASAP, and STAT testing. Most routine requests are completed the same day. Refer to the Directory of Tests for details and exceptions.

Evenings (after 3:30PM until 7:00 AM)
During these hours the laboratory is staffed with a limited number of technologists to perform the following procedures:
- Stat, Timed, ASAP, and Routine testing.
- Certain procedures are only performed on day shift due to the nature of test methodology and availability of technologists.
- See Directory of Tests for specific information.

The number of tests that will be performed as STAT or ASAP must be limited.

NURSING
STAT ORDERS will be performed in the order in which they are received in the laboratory.
The time necessary for the nursing units to receive results of these tests will depend upon the number of overall stats from all nursing units and the nature of the testing.

PRIVATE AMBULATORY PATIENTS
All private ambulatory patients must obtain an authorization from the Outpatient Registration Office before any laboratory work will be performed. Appointments must be made in advance for the following tests:
1. Bone Marrow
2. Glucose Tolerance
3. Sweat Chloride by iontophoresis
4. Chromosome Studies

The laboratory is open for OUTPATIENT WORK from 7:00AM-7:00PM Monday through Sunday.

To avoid errors, private outpatients should have written orders from their physician. An alternative to this is to have the physician’s secretary or nurse call in advance and give a list of tests to be performed. All requests for tests must have appropriate ICD9 codes or diagnosis codes included and must be signed by the physician. Stamped signatures are not acceptable. Verbal requests must be followed by written orders within 24 hours.

AMBULATORY CARE CLINICS
(Hours of Operation vary per clinic from 8:00AM to 5:30PM Monday through Fridays)
The Ambulatory Care Clinics provide phlebotomy and some POCT. Phlebotomy stations are located in FPC @ 3209 Colonial Drive and OB/GYN and Internal Medicine Clinics @ 1801 Sunset Drive.

**ER LAB**

*(Hours of Operation: 24hrs.)*

ER Lab provides a limited menu. Most Lab results available within approximately 15-20 minutes of receipt.

**MOLECULAR PATHOLOGY LAB**

**PROCEDURES PERFORMED IN THE MOLECULAR PATHOLOGY LAB**

Molecular Diagnostic

- Chlamydia trachomatis
- Neisseria Gonorrhoeae
- HIV-1 Viral Load (quant)
- HCV RNA Viral Load (quant)
- HPV, High Risk
- Prothrombin Gene Mutation
- Bordetella Pertussis/Parapertussis
- Herpes Simplex Virus (1,2)
- HIV DNA (qual)
- HIV Genotyping
- HCV Genotype
- MTHFR
- Factor V Leiden Mutation

Flow Cytometry

- Absolute CD4 count
- Fetal Hemoglobin
- Lymphoma Panel
- Acute Leukemia Panel
- Lymphocyte Evaluation
- T Helper/Suppressor
CLINICAL LABORATORY SECTION GUIDELINES

SYSTEM OF REQUEST PRIORITIES

Request priorities mutually agreed upon by Laboratory Administration, Nursing Administration, and Medical Executive Council are listed below:

Criteria and Expectations

Note: Due to the nature of testing, not all assays qualify for STAT, ASAP and Timed turn around times. Refer to Laboratory Test Directory.

1. Routine - test resulted within 4-6 hrs from receipt in the lab for most tests.

2. Timed - two (2) hour lead time for orders - collect by time specified.

3. STAT - resulted within one (1) hour after receipt in lab. ER Lab - resulted within 15-20 minutes of receipt in ER lab (selected menu), when collected and properly labeled by ER staff.

4. ASAP - resulted within two (2) hours of receipt in lab.

5. CRISIS – Tests necessary when the patient is in an immediate “life or death” situation. These requests receive priority over all (including STAT) work in the laboratory. CRISIS labs must be collected on the nursing unit and walked to the STAT LAB (ER LAB for ER patients) and are signed in a Crisis Log. These labs are processed immediately. Results will be called, please give appropriate contact.

ROUTINE

Routine requests reaching the clinical laboratory before 3:00PM each day of the week will be completed the same day with the exception of special tests. These special tests require longer procedure times and may only be performed on special days. Specific information for each test may be found in the Laboratory Test Directory in this manual. All procedures are evaluated daily with a quality control program.

TIMED

Timed specimens are specimens drawn as close to the time specified as possible. Two hour lead in time required for orders is required for centralized phlebotomy collections.

STAT

Tests necessary to evaluate “life or death” clinical conditions should be ordered as “STAT”. These requests will receive priority over all work in the laboratory with the exception of CRISIS. They will be performed without delay. Stat orders are completed in the order in which they are received in the lab. An emergency request may be made by calling the laboratory and immediately entering the order.

CRISIS

Tests necessary when the patient is in an immediate “life or death” situation. These requests receive priority over all (including STAT) work in the laboratory. CRISIS labs must be collected on the nursing unit and walked to the STAT LAB (ER LAB for ER patients) and are signed in a Crisis Log. These labs will be processed immediately. Results will be called, please give appropriate
contact.

ADD
To be used only “to add on” to orders that have already been COLLECTED AND RECEIVED in the lab. Barcode labels will print in the main laboratory and laboratory personnel will check to see if the specimens are adequate for testing. Lab will call the unit if not adequate.

ADDS
To be used only “to add on” to STAT orders that have already been COLLECTED AND RECEIVED in the lab. Barcode labels will print in the main laboratory and laboratory personnel will check to see if the specimens are adequate for testing. Lab will call the unit if not adequate.

DUPLICATE ORDERS
An order inquiry should be checked before orders for laboratory procedures are entered into the computer. This will ensure that duplicate entries, resulting in duplicate charges to the patient, are not made. If duplicate orders are entered, floor must cancel.

MED-PRO BACKUP SLIPS
Please do not use backup slips for ordering laboratory tests when the computer terminal is not functioning unless: a) the tests need to be ordered “STAT” or b) the computer is down for an extended period. When it is necessary to use backup slips, please enter all information including correct Patient Name, MR#, Account #, ordering physician, location, test description and test code, and priority. Please send completed forms (all 3 copies) to the laboratory. Tickets must be legible and with the patient location defined.
Normal procedure is not to follow up a backup slip with a computer order when system comes back up.

TIMED URINE INSTRUCTION
Containers for 24 hour urine collections must be obtained from the Specimen Processing Section in the laboratory. Laboratory Staff will check for inpatient orders for the 24 hour collection and will label the container with patient’s name and MR# with a permanent marker. Instructions are printed on forms attached to the container at the time of pick-up from the laboratory. Floors must enter the patient’s height and weight in metric units as an order for Creatinine Clearance is placed in Cerner. In addition, all information on the data form must be complete, to include proper patient identification and times of collection. Height and weight in metric units are also required on creatinine clearances. Specimens cannot be processed until lab has information on data tag (See Appendix for form).

Note: Clinic patients may obtain 24hr. urine container from clinic labs, patients must bring a filled out ancillary request form when picking up container. Before giving the outpatient the 24 hour urine container, the Clinic Lab staff will label the container with the patient’s name and MR# with a permanent marker. Test will be ordered when patient returns with 24hr. urine. A serum specimen is also required for Creatinine Clearance.

COLLECTION OF URINE
To ensure accuracy of urinalysis results, the urine must be properly collected. Improper collection
may invalidate the results, no matter how skillfully the tests are performed.

**Methods of obtaining freshly voided urine samples:**

A freshly voided urine specimen is adequate for most urinalysis testing **except the bacterial examination (urine culture and sensitivity).**

The patient should be instructed to void directly into a clean, dry container or into a clean dry bedpan and then transfer the specimen directly into an appropriate container. Specimens from infants and young children can be collected in a disposable pediatric collection device, consisting of a plastic bag with an adhesive backing around the opening to adhere to the child so that he voids directly into the bag.

All specimens should be covered immediately, labeled with the patient’s name, hospital number, **date and time of collection**, etc. and brought or sent without delay to Specimen Processing area of the laboratory.

Mislabeled specimens cannot be processed.

The specimen is then received into the laboratory computer system by laboratory personnel and taken to the appropriate department(s).

**Methods of obtaining a clean voided (“clean catch”) specimen:**

Use this technique for a specimen likely to be contaminated with vaginal discharge or menstrual blood, or when collecting a specimen for bacteriological examination.

The most commonly used procedure for obtaining a suitable specimen for bacteriological examination is the collection of a clean voided midstream specimen. Bladder catherization and percutaneous suprapubic aspiration of the bladder may be used, but only in unusual circumstances, i.e., infants). Collection of clean voided specimens is the method of choice unless specific contradictions exist.

To avoid contamination of the voided urine organisms in the area adjacent to the meatus, this area must be cleaned thoroughly before patient voids. To avoid contamination of the specimen with organisms often harbored normally in the distally urethra, the first urine is discarded and subsequent midstream urine is collected.

A satisfactory technique for female patients consists of:

- Spreading the labia and cleansing the area with a towelette. The washing is accomplished by making a single front to back motion with three separate areas of the towelette. One motion is used to cleanse the area on one side of the meatus, one area for the other side and the last area for the center of the meatus.

- While the labia are held apart, a small amount of urine is passed into the toilet or bedpan (to be discarded).

- A midstream specimen is collected in the sterilized container which is immediately closed with the appropriate lid.

A comparable technique is used for males:

- Retracting the foreskin of the penis, cleansing the glands and particularly the area...
surrounding the meatus, with three different areas of the towelette.

With the foreskin still retracted, a small amount of urine is passed into the toilet or bedpan (to be discarded). From the subsequent midstream urine a specimen is collected in the sterilized container.

For infants and children who have not yet been toilet trained, sterilized disposable collection devices can be used to obtain specimens after the perianal area has been suitably cleaned.

**Method of obtaining timed urine specimen:**

Collect urine for time period stated on physician’s order.
To begin the collection time the patient should void and discard the urine. The time of the discarded void will be the start time of the collection.
All urine voided for the time period allotted should be saved in the proper container.
The cut off time is the time of the last voided specimen and should correlate with the time period request by the physician.
Proper notation of the start and end times is vital for accurate collection periods and accurate calculated results.
SPECIMEN LABELING AND HANDLING

FOR SPECIMENS COLLECTED ON NURSING UNITS:

Specimens which are collected on the nursing unit should have the following information included on the specimen label and, during downtime situations, on the computer request form in the appropriate spaces:

1. Time and date specimen collected.
2. Initials of person collecting specimen or ID number.
3. Notation of all laboratory tests to be performed on the specimen and on the back up request form if in downtime.
4. Complete patient name, account number, and unit record number.
5. Source of specimen on specimen and back up request form during downtime.
6. Identification must be verified at time of drawing by matching patient’s name, unit record number and the account number on the armband with request or lab label or other source of patient identification. Out Patient identification may be verified with patient’s name and birth date if arm-banding is not available. Positive patient ID and labeling at the bedside is critical to the collection process.
7. Specimens that are delivered to the lab mislabeled will be automatically discarded once floor has been notified by lab personnel.
8. All body fluid specimens except urine must be hand delivered to the Core Lab (Hematology section) and orders logged into the body fluid log.

In accordance with the Universal/Standard Precautions Policy in effect at PHR:

1. Specimens should be received in sealed plastic transparent bags, including all urine, stool, fluids, cultures or blood.
2. Specimens that are leaking, spilled, broken, or otherwise damaged, or that have containers that have been contaminated will not be accepted.
3. Urine specimens from the hospital floors that are received spilled or leaking will be discarded and the floor notified to recollect specimen.
4. Specimens in syringes with needle attached will not be accepted.
5. Mislabeled specimens will be discarded unless attending physician requests re-labeling and proper documentation is signed in the laboratory.
REQUESTS GENERATED FROM CERNER
To order Labs from Powerorders, type in the needed test in the Search screen and double-click on the test name. The order details screen opens up. For one-time orders, choose a Priority of either Stat, Routine, or Crisis as appropriate. The Frequency field defaults to OT (one time).

For all recurring orders, choose a priority of Timed. There are 2 main ways to accomplish the Frequency Field:

1. For recurring orders that are collected once daily at the unit's usual collection time in the morning, choose the AM Labs (Daily) frequency. DO NOT alter the Start Date/Time. The AM Labs/Daily frequency is programmed in the background for the correct collection time. If this is being ordered late in the evening, it is best to order the test due the next morning as a one time, and then order the rest as Recurring with the AM Labs (Daily).

2. Or the correct Start Date/Time field can be chosen, and the correct frequency (i.e. Daily, q6h, etc.) filled in.

For all Lab orders, make sure the Nurse to Collect field is correctly filled in with either Yes or No.

Note: Routine orders placed after 2130 will be assigned to the 1st routine batch for the next day (0630).

VIRAL AND RICKETTSIAL REQUEST FORMS
Call the Send-Out Department for specifics #7609

BLOOD/BONE MARROW COLLECTIONS FOR CHROMOSOME ANALYSIS
The units will order a chromosome analysis on a patient exhibiting abnormalities or deficiencies. The patient’s nurse or physician will collect the blood and have the specimen brought to the laboratory.

Specimen requirements:

1. 2-3cc of peripheral blood collected in a sodium heparin tube only.
2. 2-3cc of bone marrow drawn through a sodium heparin coated syringe and placed in a sodium heparin tube.

The Blood/Bone Marrow specimen is taken to Send Outs to be sent to the Genetics Lab. Specimens that are collected on off business hours should be kept a room temperature until delivery to the Lab the next day. A specimen should never be allowed to sit in the laboratory over the weekend. In the event a specimen should be collected on Friday or Saturday, then Genetics Lab personnel should be notified.

Forms to be completed by the ordering physician are available from Send Outs. This completed form must accompany specimen.

ROUTINE ADMISSIONS AND PRESURGICAL ORDERS
Requests for admissions laboratory work ordered by the physician will preferably originate from the Admitting Nurse in the Admitting Office or from the nursing unit after admission of the patient. Patients who are able to do so will be brought to the laboratory for the collection of all admission
blood and urine tests ordered by the physician.

**REQUESTS GENERATED FOR TOMORROW**

A laboratory request may be ordered “today” for a test to be performed “tomorrow” by the following procedure:
1. Priority - Timed
2. Enter time to be performed.
3. Enter the date the test is to be performed.

**NOTE:** Do not enter requests for tests to be done in excess of two days, e.g., order only test for “today” and “tomorrow”. Orders entered any further in advance create specimen collection and billing problems.

**EMERGENCY ROOM PATIENTS**

ER Lab performs the following tests with rapid turn around time: Basic Metabolic Panel, CBC, routine urinalysis and urine pregnancy. Turnaround time under optimal conditions is fifteen to twenty minutes.

ER specimens to be analyzed in the Main Lab are transported via the pneumatic tube system.

**ADD ON ORDERS: ADD & ADDS**

To be used only “to add on” to orders that have already been collected and received in the lab. Barcode labels will print in the lab, and lab will check to see if the specimens are adequate for testing and will call the unit if it is not adequate.

**ORDERS FOR PATIENTS ADMITTED AS TRAUMA M (MALE) AND F (FEMALE)**

1. Once specimens have been collected and labeled as Trauma Male or Female with sequential number and sent to the laboratory, orders in the computer should not be canceled and re-entered when the person’s identity is obtained. The unit record number will stay the same.

2. When patient’s identification is obtained, registration is up-dated, the Trauma Male or Female is replaced with patient’s name. The unit record and account numbers remain the same. Be sure to say “Y” to keep previous name in MPI file.

**NOTE:** Medpro backup slip may be used when computer is not functioning.

3. Additional requests entered under the person’s name should be noted in the comments section of the request slip that they were previously identified as Trauma Male or Trauma Female, the assigned number, and old unit record number. (Example: Trauma Male #3, UR#01-21-67-2).
ORDERS FOR NON-BLOOD SPECIMENS

Non blood specimens must be collected and sent to the lab on same date of order. (Do not order in advance).

ADD ON ORDERS
To be used only “to add on” to orders that have already been collected and received in the lab. Barcode labels will print in the lab, and lab will check to see if the specimens are adequate for testing and will call the unit if it is not adequate.

STAT PROCEDURES
The following tests are those which will be performed on an EMERGENCY basis. The time listed for the performance of each test is the MINIMUM time required for completion of the test after the specimen is received in the laboratory and when the laboratory is fully-staffed with all equipment in working order. When multiple requests are received at the same time, some tests may take longer to complete. These times are for use ONLY when TRUE EMERGENCY exists. Stats are processed in the order in which they are received in the lab.

<table>
<thead>
<tr>
<th>TEST</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABO/Rh Type</td>
<td>15 Minutes</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Acetone</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Albumin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Alcohol (Diagnostic Only)</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Alkaline Phosphatase</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Ammonia, Plasma</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Amylase</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Amylase, Urine</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Basic Metabolic Screen</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Beta HCG</td>
<td>1 Hour</td>
</tr>
<tr>
<td>Bilirubin, Direct</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Bilirubin, Total</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Blood Culture, Broth (See Culture Blood Broth)</td>
<td>Collected Stat</td>
</tr>
<tr>
<td>Blood Urea Nitrogen (BUN)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>BNP</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Calcium</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Cell Count and Diff, Extravascular Fluids</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Chemical Screen, Urine</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Chloride</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>CKMB</td>
<td>1 Hour</td>
</tr>
<tr>
<td>CO2 (Carbon Dioxide)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count Without Differential</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count/Auto Differential</td>
<td>40 Minutes</td>
</tr>
<tr>
<td>Complete Blood Count/Manual Differential</td>
<td>90 Minutes</td>
</tr>
<tr>
<td>Coombs, Direct</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>CPK, Total</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Creatinine, Phosphokinase (CPK)</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Test</td>
<td>Turnaround Time</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Creatinine</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Differential</td>
<td>90 Minutes</td>
</tr>
<tr>
<td>Digoxin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Dilantin</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Electrolytes</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Electrolytes, Urine (excluding chloride)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>GGT</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Glucose, Extravascular Fluids</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Glucose</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Glucose, Urine, Qualitative</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Gram Stain (Smears)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Hemoglobin/Hematocrit</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>HIV-1 Screen (Rapid test)</td>
<td>45 minutes</td>
</tr>
<tr>
<td>India Ink Prep</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Ketones, Urine</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Lactic Acid, Plasma</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Lactic Dehydrogenase (LDH)</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Lipase, Serum</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Magnesium</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Microscopic Examination, Urine</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Occult Blood, Urine</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Osmolality</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Osmolality, Urine</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>pH, Urine</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Plasma Protein Fractions</td>
<td>Issued on Order</td>
</tr>
<tr>
<td>Platelet Pheresis</td>
<td>Ordered from Red Cross</td>
</tr>
<tr>
<td>Platelet Count</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Potassium</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Pregnancy Test, Urine</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Protein, Extravascular Fluids</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Protein, Total</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Protein, Urine, Qualitative</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Protein, Urine Quantitative</td>
<td>45 Minutes</td>
</tr>
<tr>
<td>Prothrombin Time</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Prothrombin Time and PTT</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>PTT (Partial Thromboplastin Time)</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Rapid Adenovirus Test</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Rapid Influenzae A &amp; B Test</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>Rapid RSV Test</td>
<td>30 Minutes</td>
</tr>
</tbody>
</table>
• Rapid Strep Test 15 minutes
• Red Blood Cell Count 30 Minutes
• Reducing Substances, Urine 60 Minutes
• Reticulocyte Count 45 Minutes
• Salicylate 45 Minutes
• Sedimentation Rate 60 Minutes
• Serum Iron 45 Minutes
• SGOT/AST 45 Minutes
• SGPT/ALT 45 Minutes
• Sickle Cell Test 60 Minutes
• Sodium 30 Minutes
• Sodium, Urine 30 Minutes
• Specific Gravity, Extravascular Fluids 20 Minutes
• Specific Gravity, Urine 60 Minutes
• Spinal Fluid Profile 1 Hour
• Cell Count and Differential 1 Hour
• Glucose 30 Minutes
• Protein 45 Minutes
• Tegretol/Carbamazepine 45 Minutes
• Theophylline 45 Minutes
• Thrombin Time 60 Minutes
• Troponin I 45 Minutes
• Type/Crossmatch Packed Cells/Whole Blood (if blood available at PRMH) 45 Minutes
• Type/Screen 30 Minutes
• Uric Acid 45 Minutes
• Valproic Acid-Stat 1 Hour
• White Blood Cell Count 30 Minutes

**TYPE OF BLOOD COLLECTION TUBES**

Vacutainer tubes are used for the drawing of blood, with a few exceptions. They are coded as to content by different colored tops (rubber stoppers or hemoguard tops). Some contain anticoagulants required by specific tests and others contain no anticoagulant. When stocked on floors or in units expiration dates on tubes must be monitored.

The Laboratory Test Directory provides information on the type of tube required and the amount of blood needed for tests performed in this laboratory and for tests which are sent to reference laboratories.

Listed below are the types of blood collection tubes available in the laboratory.
BLUE TOP:
This tube type contains 3.2% of Buffered Sodium Citrate as the anticoagulant. The tubes are available in different sizes. The 2 mL tube contains 0.2 mL of anticoagulant and will be filled with 1.8 mL of blood. This is considered a neonate draw tube. The 3.0 mL tube contains 0.3 mL of anticoagulant and takes 2.7 mL of blood. It is used for prothrombin time and other coagulation studies. Because of the ratio of blood to anticoagulant required for accuracy, tubes must be 90% full. Short draws will only be used with physician permission. Moderate and marked hemolysis will warrant recollection.

GREEN HEMOGUARD TOP:
The inside wall of this tube is coated with lithium heparin as the anticoagulant. These are required for the collection of certain tests and may be used for a large number of tests where whole blood or plasma is required. Green top cannot be used for amylase, lipase, troponin, AST, LIVP, CMP, and HCG.

GOLD HEMOGUARD TOP SST
This tube is available in 3.5 and 6 mL size. It contains a clot enhancer and a silicone barrier which forms a seal between the cells and serum when it is centrifuged. **DO NOT USE THIS TUBE TO COLLECT SAMPLES FOR BLOOD BANK, THERAPEUTIC DRUG LEVELS OR SERUM DRUG TESTING.**

GRAY TOP:
This tube type contains Sodium Fluoride Potassium Oxalate. It is available in a 2 mL and 4 mL draw tube. It is used for lactic acid and glucose testing.

LAVENDER TOP:
This tube contains EDTA (ethylenediamintetra-acetate) as the anticoagulant and is used for most hematological procedures. This tube available in 2 mL size.

PINK:
This tube type contains EDTA (ethylenediamintetra-acetate) K2 and is used for all Blood Bank testing. This tube is available in 6 ml and 2 ml size. NOTE: 2ml FOR NEONATES ONLY

RED TOP:
Red top tubes contain no anticoagulant and are used for tests which require serum for analysis. They are available in 5ml size and do not have a silicone barrier. These tubes are exceptable for some Blood Bank procedures and all therapeutic drug levels.

WHITE TOP:
This tube type contains EDTA (ethylenediamintetra-acetate) K2 and is used for collection of HIV Viral Load specimens. It may also be used for collection of specimens for Hepatitis C PCR testing (both Qualitative and Quantitative) and HIV-1 Genotyping. This tube is available in a 5 mL size.

PEDIATRIC MICROTAINER TUBES:
MICROTAINER BLOOD COLLECTION DEVICES are the tubes of choice when collecting small amounts of specimens. The microtainers come in red tops, lithium heparin green tops and lavender tops.

NOTE: Before substituting a different type tube than the one listed, contact Phlebotomy (ext. 7216). Some substitutions may be made.
FLUID PROCESSING

PURPOSE: To facilitate fluid processing by providing guidelines that will allow the accurate and timely processing of fluid specimens.

PROCEDURE:
1. Enter all orders into the computer. Order spinal fluids (CSF) as such; order all other fluids as extra-vascular fluids. If no code is specified for the test needed order the blood code and enter the specimen type in the comment section.

2. Label specimen with patient name, unit record number, fluid type, tests ordered on each tube, and date collected. Deliver specimen to Core Lab Hematology where you will sign the fluid in and check off testing to be performed (exception for CPOE orders). Fluid specimens which are not easily replaced cannot be transported to the laboratory through the tube system.

3. In Core Lab Hematology section, log the fluid on the log provided to include all orders for the fluid specimen. An extra addressograph label can be brought to the laboratory and applied to the Fluid Log-In Sheet. All information required on the Fluid Log-In Sheet must be accurately completed. Orders placed via CPOE do not require the testing to be performed to be checked.

4. If additional orders are requested after the fluid is logged onto the log, a call must be placed to the laboratory in order for the add-on orders to be processed.

FLUID ORDERS

Hematology & Chemistry

<table>
<thead>
<tr>
<th>Test</th>
<th>Fluid Type</th>
<th>Test Code</th>
<th>Special Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Count w/ diff</td>
<td>CSF</td>
<td>CCSF</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>CSF</td>
<td>SPGL</td>
<td></td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>CSF</td>
<td>LACF</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>CSF</td>
<td>CFP</td>
<td></td>
</tr>
<tr>
<td>Amylase</td>
<td>CSF&amp;Extravascular</td>
<td>AMYF</td>
<td></td>
</tr>
<tr>
<td>Bilirubin</td>
<td>CSF&amp;Extravascular</td>
<td>BILF</td>
<td></td>
</tr>
<tr>
<td>Cell Count &amp; Diff</td>
<td>Extravascular</td>
<td>CCEX</td>
<td>Other Fluids – not for CSF</td>
</tr>
<tr>
<td>Glucose</td>
<td>Extravascular</td>
<td>GLEX</td>
<td>Other Fluids – not for CSF</td>
</tr>
<tr>
<td>LDH</td>
<td>Extravascular</td>
<td>LDHF</td>
<td>Other Fluids – not for CSF</td>
</tr>
<tr>
<td>Protein</td>
<td>Extravascular</td>
<td>TPEX</td>
<td>Other Fluids – not for CSF</td>
</tr>
</tbody>
</table>

NOTE: Any other Chemistry tests not specifically listed for fluids should be ordered as if on blood and a comment added on the order as to the true fluid type.

Immunology
<table>
<thead>
<tr>
<th>Test</th>
<th>Fluid Type</th>
<th>Test Code</th>
<th>SIM #</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDRL</td>
<td>CSF</td>
<td>VDRL</td>
<td>14270</td>
<td></td>
</tr>
<tr>
<td>Cryptococcal Antigen</td>
<td>CSF</td>
<td>CRAG</td>
<td>14260</td>
<td></td>
</tr>
<tr>
<td><strong>Microbiology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td><strong>Fluid Type</strong></td>
<td><strong>Test Code</strong></td>
<td><strong>SIM #</strong></td>
<td><strong>Special Instructions</strong></td>
</tr>
<tr>
<td>Routine Cultures</td>
<td>CSF</td>
<td>CSFC</td>
<td>14657</td>
<td></td>
</tr>
<tr>
<td>Extra-vascular BFLD</td>
<td></td>
<td></td>
<td>14661</td>
<td></td>
</tr>
<tr>
<td>Bone Marrow</td>
<td></td>
<td>BMC</td>
<td>14644</td>
<td></td>
</tr>
<tr>
<td>Joint Fluid</td>
<td></td>
<td>JFLD</td>
<td>14663</td>
<td></td>
</tr>
<tr>
<td>AFB Culture</td>
<td>All Sterile Body Fluids</td>
<td>AFBO</td>
<td>14632</td>
<td></td>
</tr>
<tr>
<td>AFB Smear Only</td>
<td>Sterile Body Fluids</td>
<td>AFBM</td>
<td>14620</td>
<td></td>
</tr>
</tbody>
</table>
*smears not done on Bone marrow or blood* |
| Fungus                       | All Sterile Body Fluids | FUNGO     | 14666 |                                           |
| Anaerobic                    | Extra-vascular | ANAC     | 14640 |                                           |
| GC Culture                   | Joint Fluid | GC       | 14665 |                                           |
| Bactigen (CIE, Meningitis Panel) | CSF       | RADF     | 14624 |                                           |
| Full Panel                   |            | RADM14628 |       | CSF Only—Not for Urine                   |
| N. Meningitidis              |            | RADH     | 14627 |                                           |
| H. Influenza                 |            | RADB     | 14626 |                                           |
| Grp B. Strep                 |            | RADS     | 14629 |                                           |
| S. Pneumoniae                |            |          |       |                                           |
| Gram Stain                   | Sterile Body Fluids | GMST     | 14700 | Order only if culture does not include gram stain |
| Fungal                       | Sterile Body Fluids | FDEX     | 14720 |                                           |
| India Ink                    | CSF        | II       | 14710 |                                           |
| Meat Fiber                   | Extra-vascular | MMFB     | 15020 |                                           |
### Referral Testing/SendOuts

<table>
<thead>
<tr>
<th>Test</th>
<th>Fluid Type</th>
<th>Test Code</th>
<th>SIM #</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral Isolation</td>
<td>All fluids</td>
<td>VIRI</td>
<td>14550</td>
<td>must be ON ICE</td>
</tr>
<tr>
<td>CMV Culture</td>
<td>All fluids</td>
<td>CMV</td>
<td>15236</td>
<td>must be ON ICE, can accept Mon-Fri (no later than 10:00am on Fridays)</td>
</tr>
<tr>
<td>Herpes Culture</td>
<td>All fluids</td>
<td>SHER</td>
<td>14343</td>
<td>must be ON ICE, also requires viral chlamydia media</td>
</tr>
<tr>
<td>Hold</td>
<td>All fluids</td>
<td>IHOLD</td>
<td>14345</td>
<td>Specify source in comments</td>
</tr>
<tr>
<td>Electrophoresis</td>
<td>CSF</td>
<td>SCSEL</td>
<td>13179</td>
<td></td>
</tr>
<tr>
<td>Myelin Basic Protein</td>
<td>CSF</td>
<td>SMBPC</td>
<td>11756</td>
<td>must be ON ICE</td>
</tr>
<tr>
<td>Oligoclonal Bands</td>
<td>CSF</td>
<td>SOLIG</td>
<td>11758</td>
<td>must be ON ICE, also requires serum specimen</td>
</tr>
<tr>
<td>PCR Testing</td>
<td>All fluids</td>
<td>CMIS</td>
<td>15990</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** To order other send out tests not listed here, please contact Referral Testing at ext. 7609.

### Hematology

<table>
<thead>
<tr>
<th>Test</th>
<th>Fluid Type</th>
<th>Test Code</th>
<th>SIM #</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synovial Fluid Crystals</td>
<td>Synovial</td>
<td>SNCR</td>
<td>14890</td>
<td>no anticoagulant</td>
</tr>
<tr>
<td>FLM</td>
<td>Amniotic</td>
<td>FLM</td>
<td>13519</td>
<td></td>
</tr>
<tr>
<td>PG Amniostat</td>
<td>Amniotic</td>
<td>PGAS</td>
<td>13518</td>
<td></td>
</tr>
</tbody>
</table>
APPROPRIATE TIMING OF SERUM DRUG SAMPLING

1. **Digoxin.** Wait 5-7 days to reach steady state. Drug concentrations should be drawn during the post-absorptive, post-distributive phase of drug elimination, i.e. during the 6-24 hour interval following the previous dose. Trough level should be drawn within 1 hour of dose. Repeat level every 5-7 days, or as dictated by a change in concurrent disease state/drug therapy, lack of response to previously adequate dose, or occurrence of adverse effects.

2. **Carbamazepine.** Do not draw levels during the first 2 weeks of therapy because autoinduction of the drug is taking place and steady state concentrations are not achieved. During the third week of therapy, wait 3-5 days before drawing level. (PHR pharmacokinetic pocket reference). A trough level drawn just before the morning dose is most appropriate for the evaluation of efficacy. (Murphy)

3. **Aminoglycosides: (gentamicin/tobramycin/amikacin) Conventional dosing.** Draw peak and trough levels when the drug is at steady state, which is at least the third dose. Peaks should be drawn 30 minutes after a 30 minute infusion and troughs may be drawn 30 minutes before the next dose, but ideally should be drawn immediately prior to the next dose. (PHR pharmacokinetic pocket reference).

<table>
<thead>
<tr>
<th>$C_{\text{trough}}$ (mg/ml)</th>
<th>Gentamicin/Tobramycin</th>
<th>Amikacin</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 – 2</td>
<td>4 - 10</td>
<td></td>
</tr>
</tbody>
</table>

**Once daily aminoglycoside dosing for gentamicin and tobramycin.** This term refers to a method of dosing that is different from conventional dosing. Do not draw peaks and troughs. A random level should be drawn between 6-14 after start of the infusion (10 hours is preferred) and applied to the appropriate nomogram to confirm the dosing interval. (Antimicrobial Agents and Chemotherapy 1995, vol 39 no. 3 p. 650-655).

4. **Phenytoin.** Levels are not necessary prior to reaching steady-state (7-28 days).

Indications for drawing plasma phenytoin levels:
1. Recurrence of seizures
2. Uncontrolled seizures
3. Following loading dose or rebolus dose
4. Following change of dosage form
5. Following dosage adjustment
6. Addition/discontinuation of interacting drug
7. Signs and symptoms of toxicity

A single phenytoin level may be drawn:
1. No sooner than 2 hours after IV loading dose or IV rebolus
2. No sooner than 6 hours after completion of an oral loading dose or oral rebolus dose.
3. 3-5 days after a change of dosage form. Draw prior to morning dose.
4. 3-5 days after initiating of changing maintenance dose. Draw prior morning dose
5. 3-5 days after adding/discontinuing a metabolism altering drug. Draw prior to morning dose

6. 1-2 days after adding/discontuing a phenytoin displacing drug. Draw prior to morning dose.
7. Signs and symptoms of toxicity; Stat and q 2-3 days
Trough levels should be drawn. Free phenytoin levels may be drawn if a patient exhibits signs of toxicity or continues to have seizure activity with a therapeutic total serum level (Free phenytoin serum concentration = 1.0-2.0 mcg/ml). (PHR guidelines for dosing and monitoring phenytoin)

5. **Phenobarbital.** Obtain level after 3-5 half-lives (20-30 days). Trough level is suggested, but timing of level is not critical. Phenobarbital’s half-life is so long, daily fluctuations in serum concentrations are minor. If administering the drug IV, wait at least one hour after infusion to avoid distribution phase. (Drug Consults). Primidone is metabolized to phenobarbital and phenylethylmalonamide (PEMA).

6. **Theophylline.** Sampling times for the various age groups, along with the reasons for the timing, are listed below (Murphy):
   - **Neonates:** (1) Two hours after the first loading dose to calculate the volume of distribution (Vd). (2) Every 4-7 days to calculate clearance and dosage adjustment.
   - **Infants:** (1) 30 min after the first loading dose, if administered intravenously, to calculate the Vd and additional loading doses (2) 12-24 hours after initiation of maintenance dose to determine if adequate concentrations are being maintained or if the drug is accumulating rapidly. (3) 72 hours after initial dosing and then every 24 hours as needed to calculate clearance and dosage adjustment. (4) Every 4-7 days once hospitalized patient is stabilized, unless otherwise indicated, to calculate clearance and dosage adjustment.
   - **Children:** (1) 30 mins after the first loading dose, if administered intravenously, to calculate the volume of distribution and additional loading doses. (2) 4-6 hours after initiation of maintenance dose to determine if adequate concentrations are being maintained or if the drug is accumulating rapidly. (3) 12-24 hours after initial dosing and then every 24 hours as needed to calculate clearance and dosage adjustment. (4) 72 hours after initial dosing and then every 24 hours as needed to calculate clearance and dosage adjustment. (5) Every 4-7 days once hospitalized patient is stabilized, unless otherwise indicated, to calculate clearance and dosage adjustment.
   - **Adults and geriatrics:** (1) 30 minutes after the first loading dose, if administered IV, to calculate the volume of distribution and additional loading doses (2) Eight hours after initiation of maintenance dose to determine if adequate concentrations are being maintained or if the drug is accumulating rapidly (3) 12-24 hours after initial dosing to determine further dosage adjustments (4) 72 hours after initial dosing to determine further dosage adjustments (5) Every 4-7 days once hospitalized patient is stabilized, unless otherwise indicated, to calculate clearance and dosage adjustment.

7. **Vancomycin.** Draw trough level 5 – 30 minutes prior to 4th dose when the drug is at steady state (4-5 half lives). Monitoring vancomycin serum levels is a controversial practice because serum concentrations do not correlate well with efficacy or toxicity of the drug. Peaks are rarely drawn. Troughs should be drawn 5 - 30 minutes before the dose. The desired trough level depends on the site of infection. Infections that are difficult to penetrate (pneumonia, osteomyelitis, endocarditis, meningitis) require higher trough levels between 15 – 20 mcg/ml.

8. **Valproic Acid.** Draw levels after steady state has been achieved (2-4 days) (Murphy). Troughs should be drawn prior to the am dose. When dose is changed, wait at least 2-4 days (to get to steady state) before rechecking serum level. (Drug Consults).

9. **Lithium.** Draw levels after steady state has been achieved (4-5 days) (Lexi-Comp). Trough levels should be drawn prior to next dose (8-12 hours post previous dose). If dose is changed re-draw trough levels after 4-5 days to again reach steady state. Therapeutic levels 0.6-1.2 mEq/l. Toxic level >1.5mEq/l. Monitoring: draw levels twice weekly until patient is stable, then draw
levels every 1-3 months.

10. Cyclosporine. Draw levels at steady state (5 t½'s = 90-200 hours) after initiation of therapy or a change in any dose. The level is drawn just prior to the next dose. Due to the wide variation in absorption, serum levels are necessary when switching for IV to PO or vice versa. Desired serum concentration depends on type of transplant, type of sample, and method of assay. For example, the desired concentration measured by HPLC on whole blood for renal transplant patients is 100-200 ng/ml.

11. Tacrolimus. Draw whole blood trough level on 3rd day of therapy. Trough levels are most variable during 1st week post-transplant. Measure daily to every three days until level stabilizes (2-4 weeks, depending on patient).

Recheck whole blood trough level with:
1. Change in hepatic or renal function
2. Signs of tacrolimus toxicity
3. Signs of graft rejection
4. Change in tacrolimus dose or route of administration ( IV ↔ PO )
5. Addition, deletion or dose change of potentially interacting drug
6. Severe illness affecting drug absorption/elimination (i.e. severe immune reaction or sepsis)
7. Suspect noncompliance
Q1.032.04 LEGAL BLOOD ALCOHOLS

1.0 Policy Statement

Palmetto Health Richland Laboratory employees may be asked to collect legal blood alcohol specimens for law enforcement. *Testing for legal blood alcohol is not preformed at Palmetto Health Richland Laboratory.*

2.0 Guidelines

2.1 Only phlebotomy is performed at Palmetto Health Richland for legal blood alcohols.
2.1.1 Testing is performed at SLED.
2.2 During the hours of 7 AM until 8 PM, the officer and client will be directed to security.
2.2.1 Security will notify the laboratory when the client arrives.
2.2.2 A qualified lab employee will go to security and obtain the specimen.
2.3 During the hours from 8 PM until 7 AM, the officer and client should come to the lab for collection.
2.4 The officer will bring the chain of custody paperwork and client permission to the lab. The permit must be obtained prior to the specimen being collected. These forms are provided by the law enforcement officer.
2.5 Permission for the test must be obtained from the client or guardian without any coercion or misrepresentation.
2.5.1 The client should be aware of the purpose and possible consequences of the test.
2.5.2 The person performing the phlebotomy should ask the client if they understand what is being done.
2.6 The specimen is collected in two 10 cc Red top tubes using *no alcohol* in the preparation of the site.
2.6.1 Betadine, Zephirin, or other non alcohol cleaner should be used instead.
2.7 The person drawing the sample must sign the permit after the blood is collected.
2.8 After proper labeling, the tube tops are sealed with liquid paraffin.
2.8.1 Paraffin is found in the Stat lab and can be taken out of the lab in a small container.
2.9 One of the labeled sealed tubes is given to the patient and the other tube is given to the law enforcement officer.
2.10 The permit form is given back to the officer.
2.10.1 One copy is kept for a lab record and for billing purposes.
2.10.2 This form should be left with the Staff Assistant for the Administrative Lab Director.
2.11 If a client inquires about having their own testing, you may tell them that private laboratories (ex Quest, Lab Core) may perform legal testing. Palmetto Health Richland does not perform legal blood alcohol testing.

3.0 Author: Karen W Sullivan MT (ASCP)

4.0 Initial Date of Policy

12/19/1980
Revised 4/13/2001
Revised 2/17/2010
Revised 3/1/2011

Effective Date: 5/9/2013
Q1.033.08 CODE 40 and 42

1.0  Policy Statement  Samples are received from patients of possible sexual assault case. Code 40’s are designated for patients 13 years and older. Code 42’s are designed for patients under 13 years old.

2.  Guidelines
2.1.  Specimens for these codes may be collected by ER staff or the Children’s Assessment Center (ARC).
2.2.  The Rapid Care laboratory and the Microbiology departments are responsible for the proper receipt and processing of all possible sexual assault patient samples.
2.3.  Specimens received may include but are not limited to
   2.3.1.  Wet mounts
   2.3.2.  Pap smears
   2.3.3.  GC culture (oral, vaginal, rectal)
   2.3.4.  GC/CHL PCR
   2.3.5.  Chlamydia (urine)
   2.3.6.  RPR (syphilis)
   2.3.7.  Urinalysis
   2.3.8.  Urine HCG
   2.3.9.  HIV
   2.3.10. other cultures (i.e. Herpes, Chlamydia).
2.4.  All ER registrations and orders will be entered by the ER staff
2.5.  Specimens and forms are checked for correctness by Rapid Care Lab Charge Tech for
   2.5.1.  name
   2.5.2.  source
   2.5.3.  test requested
   2.5.4.  registration information including date of birth
   2.5.5.  appropriate specimen collections
2.6.  If all information is correct, the Rapid Care Charge Tech will sign the “Forensic Specimen Receipt Form”
   2.6.1.  Specimens/tests ordered STAT will be performed in RC Lab
   2.6.2.  Specimens not performed in RC Lab will be taken to Microbiology, who will sign the “Forensic Specimen Receipt Form”
   2.6.3.  Specimens will be distributed to appropriate departments
   2.6.4.  Each department will have a technologist sign the “Forensic Specimen Receipt Form”
   2.6.5.  The original FSRF form is given to the Microbiology supervisor.
2.7.  The ARC staff will be responsible for completion of their patient registrations and enter orders via the ATLAS system prior to sending specimens to Central Lab MP14.
   2.6.1  Client Services will receive and distribute ARC specimens to the appropriate departments.
   2.6.2  If an ARC specimens is brought with a “Forensic Specimen Receipt Form” to Microbiology department, techs are to verify all information as with the ER specimens and sign the FSRF. Microbiology will receive these samples instead of Client Services
   2.6.3  The original FSRF form is given to the Microbiology supervisor
2.8.  Follow procedure M1.029.10

3.0  Author:  Karen W Sullivan MT (ASCP)
4.0 Initial Date of Policy

March 6th, 1996
Revised 5/15/1997
Revised 7/26/2000
Revised 7/13/2001
Revised 2/13/2009
Revised 2/17/2010
Revised 3/1/2011
Revised 5/9/2013
SPECIMEN PROCESSING

Effective Date: 10/20/14

PH1.005.13 Collection Process

1.0 General Information

1.1 Scan the patient’s armband and have them verify their name and Date of Birth.
   1.1.1 If the patient does not have an armband, DO NOT collect any blood work until an armband is placed on the patient’s arm by the nursing staff.
   1.1.2 If discrepancies are found during the identification process such as account number or MR# that does not match, do not draw the patient’s blood until a new armband can be placed on the patient by the nursing staff.

1.2 Verify proper collection tubes and quantity for unfamiliar tests with coordinator or computer system (i.e. Cerner) before start of collection.

1.3 Verify all necessary supplies and equipment is on your tray or beside you at the drawing site before starting the Phlebotomy process.

1.4 Use AIDET to establish trust.

1.5 Never force a patient to have his/her blood drawn. Attempt to reason with a reluctant patient, if refuse, inform a nurse and record your attempt on your collection sheet with the name of the notified nurse.
   1.5.1 If the patient’s doctor requests that the sample be drawn by force, the nurse present to assume responsibility.

1.6 Always wash your hands before and after each patient. Always apply new gloves between each patient.

1.7 If the patient is having, or begins having a seizure, stop the collection process and notify the patient’s nurse immediately. Nursing will give clearance before collection is continued.

1.8 Never draw blood from arteries. Should an artery be accidentally punctured, hold pressure on the site for at least ten minutes and apply a pressure bandage before leaving. Notify the patient’s nurse or nursing supervisor.

1.9 Never argue with doctors, nurses, unit clerks, patients or patients’ families. If there is a conflict or a complaint, have them contact your Supervisor, Charge Tech, Clinical Manager, or the Administrative Director.

1.10 Always call for help if a patient faints during venipuncture. Never leave the patient unattended. On the floor, nurses should be called to handle the situation; in the lab, a pathologist should be notified.

1.11 If a patient should fall or injure themselves while under our care, never allow them to leave the unit until the Supervisor, Charge Tech, Administrative Director or Clinical Manager is notified and the patient is examined by a pathologist. An incident report needs to be filled out for future reference.

1.12 Label all tubes completely (patient name, hospital number, date, time of collection, Cerner login) after the blood is drawn. Never pre-label tubes. Computer barcode labels must have date, time and Cerner login.

1.13 Specimens collected on ice or in special tubes must be brought to the laboratory within 15 minutes—no greater than 30.

1.14 Certain tests, (i.e. glucose tolerance tests) are drawn at specific intervals. Refer to glucose tolerance procedure for information on this test. For sendout tests, refer to appropriate reference lab catalog.
2.0 Inpatients

2.1 Check tray and requisitions before leaving lab to insure all necessary equipment is available for proper blood collection.

2.2 Check on sample requirements before you leave the lab if you have any doubts about what to draw.

2.3 Knock on patient’s door and announce your arrival by introducing yourself and continue with AIDET (A – Acknowledge, I – Introduce, D – Duration, E – Explanation, and T – Thank You) scripting for Excellent Service.

2.3.1 Acknowledge: the patient by name.
2.3.1.1 Hello Mr(s) ________ (while making eye contact with the patient).

2.3.2 Introduce: yourself, your reason for entering room, and your experience.
2.3.2.1 (My name is _______ and I am here from the lab to draw blood your physician has ordered for your care. I have been drawing blood for ________ years and will make this as pleasant as possible.

2.3.3 Duration: Give an estimate of time it will take you to complete the blood draw while you are identifying the patient and gathering your supplies.
2.3.3.1 Mr(s)________, I do apologize for the interruption and will be finished in about five minutes.

2.3.4 Explanation: Explain what you are doing as you go through the steps.
2.3.4.1 I must verify you are the patient I am to draw (for your safety).
2.3.4.2 I will place a tourniquet on your arm to find the best vein to insure to collect the best specimen possible.
2.3.4.3 I do need to collect____ tubes so you will see me changing tubes, but, will not feel the change.
2.3.4.4 Once the draw is complete, I will hold pressure to the site until the bleeding has stopped. I will then tape gauze to the site to apply continued pressure to insure no bleeding occurs.
2.3.4.5 If you have any questions or concerns, you can reach me at x7216.

2.3.5 Thank You: Thank the patient (and family members if in the room).
2.3.5.1 Thank you Mr(s)_______ for allowing me to help you feel better.
2.3.5.2 For Family Members: Thank you for supporting Mr(s) ______ and your cooperation during collection.

2.4 If the patient insists on knowing what you are drawing always get the patient’s nurse to answer the question(s) before proceeding with the blood collection.

2.5 Ask the patient to repeat his/her name and date of birth. Compare the name and date of birth with the information found on the Pathnet barcode label.

2.6 Do not rely on labels at the foot of the patient’s bed or on the bed’s arm rail

2.7 Perform venipuncture or capillary stick according to instructions in this manual.

2.8 Label all specimens before leaving the room with the patient’s name, hospital number, Cerner login and the time and date of collection. Document the collect time and workload on your collection sheet. Refer to B8.018.02 Labeling Specimens for Crossmatch/Type and Screen for these tests.

2.9 Apply bandage to the puncture site before leaving room; if patient is alert and requests that you not bandage the site, make sure he/she understands that pressure must be applied for several minutes to prevent bruising.

2.10 If you were unable to collect the specimen, notify the nurse in charge of the patient and also indicate “can’t stick” or “C/S”, your tech number, time and date on your collection sheet.

2.10.1 You must notify the Coordinator of the C/S and it will be assigned to another phlebotomist.
2.10.2 The unsuccessful phlebotomist is expected to accompany the reassigned phlebotomist to observe their attempt to collect the specimen.
2.10.3 If reassigned phlebotomist is unsuccessful, notify the patient’s nurse and she will notify the patient’s physician.
2.10.4 The general rule is 2 phlebotomists to attempt and each attempt 2 times each.
2.11 Specimens are promptly sent to the accessioning area to be received in the computer with proper collect time.
2.11.1 If specimen is your last collection, hand deliver the specimen to the laboratory for receiving.
2.11.2 If other collections are needed, tube the specimen to the laboratory for receiving.
2.11.3 It is your responsibility to ensure your specimens are received by clearing pendings.

3.0 Outpatients

3.1 Outpatients should be accommodated immediately.
3.1.1 Although there is usually a person assigned specifically to outpatient coverage, it is the responsibility of any phlebotomist who is available at the time to assist with outpatient collections.
3.2 Check the labels you have versus the prescription carefully and draw all blood needed. Failure to do this may result in the patient’s having to return to the hospital due to lab error.
3.2.1 If patient has to return to the hospital for recollection, it is the responsibility of the phlebotomy department to notify the patient.
3.2.2 The recollection must be documented in the outpatient Call Back log immediately along with who called the patient and when the patient will return.
3.3 Always ask the patient to state his/her full name and their date of birth/age. This is the only assurance you have that ensure you have the proper labels to collect the proper patient.
3.3.1 If patients are not able to give you the information, check to see if someone accompanying the patient can give the information.
3.3.2 Never give the information and then ask if that is correct.
3.3.3 If the patient is reluctant to give you the information, explain that it is for their protection and identification safety.
3.4 Place an aliquot label on the outpatient log sheet after the venipuncture or fingerstick is performed and document the date and time the specimen was drawn, tubes collected and your tech code.
3.5 Make sure bleeding has stopped before allowing the patient to leave the lab. This is especially important with patients on anticoagulant therapy or those with special bleeding disorders. Always place a bandage on the puncture site before the patient leaves.
3.6 All STAT priority patients must have a STAT label placed on each tube.
3.7 All collected outpatient samples are to be delivered to accessioning and handed directly to the STAT Processor.
3.7.1 Stat priority collections are to be announced to the STAT processor upon delivery.
3.7 Be sure patient collects urine specimen when indicated.

4.0 Emergency Room Patients
4.1 The Emergency Room staff collects its own specimens. In cases where a patient is
very difficult to draw and in certain other special situations, the lab may be called to assist with specimen collection.

4.2 All blood work from the Emergency Room should be collected immediately.
4.3 Often the ER physicians add last-minute orders for blood collection. Be sure that all orders have been prepared before beginning blood collection.

5.0 Decentralized Areas
5.1 Most of the areas of the hospital are decentralized so they collect their own blood work. In cases of a very difficult draw the lab may be called to assist with the specimen collection.
5.2 Ask what tests need to be collected. If they can be done by fingerstick, suggest this to them. If not, explain to the caller that we will be there as soon as we possibly can.
5.3 Phlebotomists are not authorized to:
  5.3.1 Perform arterial sticks
  5.3.2 Perform venipuncture on lower extremities — must have physician’s order to do so
  5.3.3 Draw from a central line
  5.3.4 Draw above an IV site, insert IV catheters or manipulate IV infusions
  5.3.5 Instill heparin
  5.3.6 Draw from patient with no ID bracelet
  5.3.7 Collect blood from arm with an active fistula, shunt, etc.
  5.3.8 Stick more than twice
5.4 Areas the phlebotomist should avoid:
  5.4.1 Above an IV site
  5.4.2 Patient’s receiving transfusions unless directed to do so by the caregiver
  5.4.3 Do not draw from heparin locks, central lines, IVs or fistulas
  5.4.4 Side of a mastectomy
  5.4.5 No feet extremities
  5.4.6 Swollen or badly bruised extremities
  5.4.7 Scarred areas (excessively) — can be difficult to puncture
  5.4.8 Bruising indicates a previous hematoma and is usually painful (erroneous results may be obtained due to excess tissue fluid
  5.4.9 Use care with edematous patients — excess fluid can alter test results by diluting constituents.
  5.4.10 Never stick more than 2 times
  5.4.11 DO NOT PROBE WITH NEEDLE!

6.0 Other Considerations
6.1 Patients on IV:
  6.1.1 Ask nurse to turn off IV for at least 2 minutes if drawing from same arm.
  6.1.2 Apply tourniquet, select vein other than one with IV
  6.1.3 Perform the stick
  6.1.4 Draw a red top tube or waste tube (approximately 5ml of blood)
  6.1.5 Collect the blood
  6.1.6 Document the collect time and workload on your collection sheet
6.2 Incomplete/No collection:
  6.2.1 Move needle slightly forward
  6.2.2 Move needle slightly backward
  6.2.3 Adjust angle
  6.2.4 Release tourniquet— if it is too tight can restrict blood flow into arm
6.2.5 Try another tube
6.2.6 Re-anchor the vein in case it has rolled

6.3 **Blood Stops:**
6.3.1 Vein collapse — try smaller tube
6.3.2 Needle pulled out — start over
6.3.3 Try new tube

6.4 **Difficult Patients/Patient Refusal:**
6.4.1 Try to persuade the patient to permit the blood collection. Emphasize that the physician wants this done.
6.4.2 Do not discuss or explain ordered test. This is the physician’s responsibility.
6.4.3 If gentle persuasion does not work, report problem to the nurse. The nurse may be able to persuade the patient.
6.4.4 If patient still refuses, obtain the nurse’s name, document on the lab log and return to the lab. Share this information on to the coordinator.

6.5 **Other Problems:**
6.5.1 Hematoma formation — abort immediately
6.5.2 Arterial stick hold extended pressure and document
6.5.3 Patient refusal — try to convince, notify nurse and document
6.5.4 Fainting — stop, inform nurse (if outpatient, notify pathologist on clinicals)
6.5.5 Convulsions stop, call for help (same as above)
6.5.6 Communication problems — ask for assistance
6.5.7 Tremors — ask for assistance
6.5.8 Do not stick where there are casts, dressings, fraction
6.5.9 Do not stick when there are no signs of life
6.5.10 **ALWAYS** observe special precautions

Initial Author, Date: J. Dixon, November 22, 1995

Revised by: Rachele Bosley, November 20, 1998
Rachele Bosley, May 20, 1999
Kendal Ringer, October 30, 2002
Kendal Ringer, August 11, 2003
Kendal Ringer, July 26, 2004

Angela McCrea, July 24, 2005
Paula Lundy, November 9, 2007
Paula Lundy, May 7, 2009
Paula Lundy, March 4, 2011
Toni Aversa, March 14, 2014
Toni Aversa, May 9, 2014
Toni Aversa, October 16, 2014
PH1.016.07 Correct Order for Drawing Tubes

1.0 Purpose: An order of draw is used during the collection process to reduce the effects of cross-contamination. Cross-contamination occurs during the tube exchange when a drop of blood mixed with tube additives enters the following tube. Cross-contamination can result in the patient being redrawn due to the contamination.

2.0 Examples of additive tubes:
2.1 Green top – Lithium Heparin, Sodium Heparin
2.2 Gray top – Fluoride, Oxalate
2.3 Purple/Pink top – EDTA
2.4 Blue top – Citrate
2.5 Gold/Red – SST

3.0 RECOMMENDED order of draw
3.1 Blood cultures
3.2 Blue
3.3 Gold/Red SST
3.4 Green
3.5 Lavendar/Pink
3.6 Other additive tubes (gray, etc.)

4.0 Reasoning behind this order of draw:
4.1 The blood culture tubes are drawn first to avoid contamination.
4.2 The coagulation tubes (blue) may be drawn first for PT/INR or aPTT testing with syringe or vacutainer collections.
   4.2.1 A blue top partially filled discard tube must be drawn for all coagulation tests collected with a winged collection set to prime the tubing of the collection set.
4.3 Additive tubes are drawn last to prevent contamination of the non-additive tubes.

5.0 Reference:
5.1 Calem, Roger R., Ph.D., Additive and the Importance of Draw, St. Johns Hospital, Detroit, MI.
5.2 Clinical and Laboratory Standards Institute H3-A6 Volume 27 Number 26, Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture.

Initial Author/Date: J. Dixon, December 19, 1994
Revised by: Rachele Bosley, November 22, 1998
Kendal Ringer, August 11, 2003
Paula Lundy, February 5, 2008
Paula Lundy, May 6, 2009
Paula Lundy, February 10, 2010
Paula Lundy, August 17, 2011
Q1.018.05 PANIC VALUE / CRITICAL TEST

1.0 Policy Statement  
Panic values are results that warrant immediate attention due to potential life threatening consequences. Tests that are deemed critical (life or death) in nature by the provider or caregiver based on the patient clinical condition can be ordered as CRISIS priority and delivered to the lab.

2. Guidelines

2.1 Reporting Panic / Critical results
2.1.1 All results are reviewed by the resulting tech before being accepted in the LIS.
2.1.2 The Laboratory Computer System (LIS) will flag panic values as “failed verify” in most cases, some Blood Bank and Microbiology codes are exceptions in the LIS but are defined in procedures.
2.1.3 Panic values are determined by the Technical Supervisor, Pathologists, physicians with the aid of clinical references.
2.1.4 Panics may be reflected by the reference lab when test is not performed on site.
   2.1.4.1 These results will be called and documented by Send Out (SO) department upon releasing the results daily.
   2.1.4.1.1 Sunday’s Core Lab Charge Tech will be responsible for calling results received after SO department closes on Sat and results received day shift on Sunday.
2.1.5 Specimen characteristics are noted on the report where appropriate.
2.1.6 Panics by ordering location:
   2.1.6.1 Inpatient panic values are called to the M.D., charge nurse or nurse assigned to the patient.
   2.1.6.2 Outpatient panic values are called to the M.D. or nurse at the physicians’ office.
   2.1.6.3 OutReach panics are called to the client as soon as possible according to the schedule approved by their Medical Director.
2.1.7 Panic results are called to the appropriate individual immediately upon resulting with exceptions as outlined above for Outreach and SO.
2.1.8 Do not give results to the answering service or leave on answering machines.
2.1.9 Have the person receiving results read back the panic value to verify accuracy to include
   2.1.9.1 Full name and MR# of patient
   2.1.9.2 Test name
   2.1.9.3 Panic result with units of measure
2.1.10 Note the last name of the person receiving results and the time the results were called in the computer next to the associated panic value.
2.1.11 At the discretion of the Senior Tech, the pathologist may be notified.
   2.1.11.1 Results indicated an unusual condition
   2.1.11.2 Results are questionable
   2.1.11.3 Tech is unable to contact responsible party
2.1.12 Any attempts to notify the appropriate person of critical results must be documented in the computer.
2.12.1 The section supervisor should be notified of failure to contact an appropriate person to take the result and action should be taken to prevent recurrence of the communication problem.

2.2 Critical Tests
2.2.1 If patients are in life or death situations, test may be ordered under CRISIS priority.
2.2.2 Labs will be ordered under CRISIS priority in Cerner.
2.2.3 Samples will be hand delivered to the laboratory and given to the charge tech who will be responsible.
   2.2.3.1 If the sample cannot be delivered to the lab, a call can be made to the supervisor or charge tech to alert that the sample(s) will be tubed to the lab.
   2.2.3.2 Supervisor or charge tech will go to the tube system immediately to retrieve the sample(s).
2.2.4 Samples will be logged into the CRISIS lab log book
2.2.5 Tests will be run and resulted as soon as possible before any other testing, with a goal of less than 15 minutes TAT.
2.2.6 Crisis test results will be called.

2.3 Reportable Disease Reporting
2.3.1 PHR will comply with all state and national reportable disease notification listings.
2.3.2 Results that require notice within 24 hours will be reported to the ordering physicians.
2.3.3 Results that are to be reported within 7 days will be sent to DHEC.
2.3.3 All qualifying results will be reported to DHEC.

2.4 Significant or Unexpected Surgical Pathology Findings
2.4.1 When the Pathologist discovers significant or unexpected surgical pathology findings they will immediately notify the submitting physician as indicated, either by telephone or pager. Findings may include, but are not limited to
   2.4.1.1 unexpected malignancy
   2.4.1.2 discrepancies between frozen sections diagnosis and permanent section findings
   2.4.1.3 significant findings on special stains
2.4.2 This notification is documented as a comment in the surgical pathology report.

3. Palmetto Health Richland Policies
3.1 Critical Test Results, Communication of

4.0 Initial Date of Policy 12/12/1992
   Revised 7/19/02
   Revised 10/9/07
   Revised 2/5/09
   Revised 3/30/09

Effective Date: 02/24/2010

PH1.010.06 BLOOD COLLECTION: VENIPUNCTURE

1.0 Principle: A patient’s veins are the main source of blood for laboratory testing as well as a point of entry for IVs and blood transfusions. Since only a few veins are easily
accessible to both laboratory and other medical personnel, it is important that everything be done to preserve their good condition and availability.

2.0 Equipment
2.1 Tourniquet
2.2 70 % alcohol prep pads
2.3 Dry gauze pads
2.4 Appropriate evacuated tubes for test ordered
2.5 Evacuated blood collection system holder or syringe
2.6 Plastic adhesive pressure strip
2.7 PPE – gloves (goggles, face shield, and gown as needed)

3.0 Procedure
3.1 Review the request forms. See what test(s) have been ordered and that you have the appropriate tubes.
3.2 Be sure to knock on the patient’s door before you enter the room.
3.3 Properly identify the patient. This is the most important step in the performance of a venipuncture. Always check the patient’s identification band against the test orders. Do not draw a patient if he/she is not wearing an armband.
3.4 Use AIDET (Acknowledge, Introduce, Duration, Explanation, and Thank You)
3.5 If the patient wants to know more information, refer his/her questions to the nurse.
3.6 Check for diet restrictions
3.7 Check above the patient’s bed for any restrictions concerning the collection of blood.
3.8 Properly position the patient.
3.9 Always wash hands before and after each patient. Always wear new gloves with each new patient.
3.10 Prepare your equipment before you apply the tourniquet.
   3.10.1 Select the proper size needle. Needle choice depends on the size of the vein.
   3.10.2 The most frequently used needle is the 21 gauge. The higher the gauge number, the smaller the diameter or bore.
   3.10.3 For extremely small veins, use a 22 or 23 gauge needle.
   3.10.4 The length of the needle (1 to 1.5 inches) is an individual choice.
3.11 Select site for venipuncture. DO NOT DRAW BLOOD ABOVE AN INTRAVENOUS INFUSION.
3.12 Application of Tourniquet: Wrap the tourniquet around the arm approximately 3 to 4 inches above the area where you are going to “feel” for a vein. Hold one end taut and tuck a portion of the end under the taut end to form a loop.

3.13 Clean venipuncture site with 70% alcohol after locating the vein of choice to stick. Dry with a dry gauze pad.
3.14 Grasp the patient’s arm approximately 1 to 2 inches below the venipuncture site. Pull the skin tight with your thumb to keep the vein from rolling.
3.15 Perform the venipuncture.
   3.15.1 The needle should be held at approximately a 15 degree angle to the patient’s arm and in a direct line with the vein.
   3.15.2 The syringe or tube should be below the venipuncture site to prevent backflow, and the arm (or other venipuncture site) be placed in a downward position.
   3.15.3 Turn the needle so that the bevel is in an upward position.
   3.15.4 Puncture the vein. The puncture of the skin and vein should be done, if
possible, in one motion.

3.15.5 If a syringe is used, care must be taken not to pull on the plunger too rapidly or forcefully.

4.0 Quality Assurance

4.1 Do not attempt to stick a patient more than two (2) times. If after the second attempt you are unsuccessful, obtain help from another phlebotomist.

4.2 **DO NOT STICK ABOVE AN IV.** If an IV is running in both arms, and no other vein is available except in the arm of the IV administration, specimens may be drawn below the IV as follows:

4.2.1 Speak with the patient’s nurse to see if he/she will turn off the IV for no less than 2 minutes before venipuncture.

4.2.2 Apply the tourniquet below the IV site. A vein other than the one with the IV should be used.

4.2.3 After performing the venipuncture, draw 5mL of blood. Discard this blood then draw the blood sample to be used for testing.

4.3 Make sure that all blue top tubes have a “full draw.” Improperly filled tubes will not be accepted for testing.

4.4 A discard tube must be drawn before the blue top tube if the phlebotomist is collecting the sample with a winged collection set. The discard tube must be a plain red or blue top tube.

4.5 Label all tubes **AFTER** you have stuck the patient, **NEVER BEFORE**.

4.6 If swelling occurs around the venipuncture site during collection, immediately release the tourniquet, remove the needle, and apply pressure with the gauze pad.

4.7 **USE NEEDLES AND LANCETS ONLY ONCE AND DISCARD IN A SHARPS CONTAINER**

4.8 **NEVER DISPOSE OF USED NEEDLES IN THE WASTE BASKET**

4.9 **NEVER RECAP A USED NEEDLE.**

4.10 **NEVER CUT A USED NEEDLE.**

4.11 Do not keep the tourniquet on a patient’s arm for more than 1 to 2 minutes.

4.12 The order of tube draw is important for obtaining accurate values and preventing the risk of contaminating a subsequent tube with the additive from a tube just collected.

4.12.1 If a tube containing the potassium salt of EDTA is collected prior to a tube for electrolyte evaluation, it is possible the potassium value could be falsely increased.

4.12.2 The order in which blood is added to tubes when a syringe is used is important, because of the possibility of micro clots, which can cause erroneous coagulation and hematologic results.

4.12.3 Please follow the correct order of draw as described in CLSI H3-A6.

5.0 References:


PH1.017.09 Collection and Handling of Coagulation Specimens

1.0 Purpose: Specimens collected for coagulation studies must be drawn properly to ensure a good sample is obtained. Special attention must be given to patients who are on IV heparin to avoid specimen contamination.

2.0 Drawing Procedure

2.1 All coagulation tests must be drawn as the second tube if the collection is with a winged collection set and mixed immediately.

2.1.1 The discard tube must be used to prime the tubing of the collection set.

2.2 PT/INR and aPTT coagulation tests can be drawn as the first tube with collections by syringe or vacutainer and mixed immediately.

2.3 If the patient is receiving IV heparin:

2.3.1 The best collection is a peripheral stick in the opposite arm. The nurse should turn off the IV for 10 minutes prior to this collection.

2.3.2 If a line draw is performed, the nurse should turn off the IV for 10 minutes prior to the collection.

2.3.2.1 Then perform a 10cc flush before collecting the sample in a separate syringe.

2.3.2.2 Then transfer the appropriate amount of blood from the syringe to the 3.2% Sodium Citrate tube.

2.4 Mix collected tube immediately and send to Specimen Processing.

3.0 Collection Tubes

3.1 BD 3.2% Sodium Citrate

3.2 For normal hematocrits, collect the following amounts:

3.2.1 Tube volume 3.0 ml = 0.3 ml Citrate and 2.7ml Blood

3.2.2 Tube volume 2.0 ml = 0.2 ml Citrate and 1.8ml Blood

4.0 Unacceptable Specimens

4.1 Coagulation tubes less than 90% full.

4.2 FSP tubes that are filled more than the required 2 mL volume.

4.3 Clotted specimens.

4.4 Coagulation specimens that are moderately or grossly hemolyzed are unacceptable for testing.

4.5 Prothrombin Time (PT) over 24 hours old if unopened. Over 8 hours old if opened.

4.6 PTT over 4 hours old.

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Revised by: Dee Dailey, August 5, 1997
Rachele Bosley, September 10, 1997
Rachele Bosley, November 22, 1998
Dee Dailey, July 6, 2001
Kendal Ringer, April 30, 2003
Angela McCrea, August 1, 2005
Paula Lundy, February 5, 2008
Paula Lundy, December 3, 2010
VENIPUNCTURE QUALITY ASSURANCE

BLOOD COLLECTION: VENIPUNCTURE

1. Do not attempt to stick a patient more than two (2) times, if after the second attempt you are unsuccessful, obtain help from another phlebotomist.

2. **DO NOT STICK ABOVE AN IV.** If an IV is running in both arms, and no other vein is available except in the area of the IV of the administration, specimens may be drawn below the IV site as follows: (1) Speak with the patients nurse to see if he/she will turn off the IV for no less than 2 minutes before venipuncture. *Never turn off IV yourself! Notify nurse to restart IV after you finish and document!*

3. Make sure that all blue top tubes have a “full draw”, or appropriately filled. Partial draws will not be accepted for testing. Always draw another tube, preferably a red tube, before collecting the specimen in the blue tube.

4. Label all tubes **AFTER** you have stuck the patient, **NEVER BEFORE**.

5. If you notice the venipuncture area beginning to swell while you are drawing the blood, immediately release the tourniquet, remove the needle, and apply pressure with the gauze square.

6. **NEVER DISPOSE OF USED NEEDLES IN THE WASTE BASKET.**

7. Do not keep the tourniquet on patient’s arm more than 1 to 2 minutes.

8. The order of tube draw is important for obtaining accurate values. This is suggested especially when using the evacuated tube system, because there is a risk of contaminating a subsequent tube with the additive from a tube just collected. For example, if a tube containing the potassium salt of EDTA is collected prior to a tube for electrolyte evaluation, it is possible that the potassium value could be falsely increased. Likewise, the order in which blood is added to tubes when a syringe is used is important because of the possibility of micro clots, which can cause erroneous coagulation and hematologic results. The recommended order of draw is outlined on the following page.
BLOOD COLLECTION FROM INFANTS

PRINCIPLE:
To obtain adequate and accurate blood specimens from infants with the least amount of trauma while maintaining good isolation techniques. Routine venipunctures are not performed on patients under 12 months of age unless an experienced phlebotomist is comfortable with performing venipuncture.

EQUIPMENT:
Gloves, gauze pads, alcohol swabs, sterile lancet, microcollection tubes, 4x4 gauze pads to wrap the foot.

PROCEDURE:
1. Observe the safety regulations required for entrance into the infant care facility.
2. Review the request for type of test(s) ordered and prepare the required equipment, including labeling materials.
3. Use only blood collection tray designed for the nursery units.
4. Remove all jewelry.
5. Wash hands with supplied soap using aseptic technique. (See section on proper hand washing for nursery units).
6. Put appropriate personnel protective safety gown.
7. Sleeves must be pushed above the elbows at all times while in the nursery units.
8. Approach the patient.
9. Observe feet for any unusual marks, bruising, skin tears or abrasions and notify nursing personnel immediately. Document name of the staff nurse notified.
10. Identify the patient by matching the request label (full name and MR #) with the patient’s ankle bracelet. Account numbers are essential for glucose screen testing.
11. Apply a heel warmer to the site for 3 minutes.
12. Cleanse the site with alcohol and allow to air dry. The presence of alcohol will quickly hemolyze the blood.
13. Mix all additive tubes properly. Failure to mix immediately after collection will cause clots to form.
14. Properly label all samples collected for transport to the laboratory to the laboratory specimen processing center.
15. Properly dispose of all contaminated collection materials.
16. Wash hands using aseptic technique.
QUALITY ASSURANCE NOTES:
1. Make sure the area for the skin puncture is completely dry before carrying out the procedure.
2. Remember to not squeeze the heel too tightly so as to avoid diluting the blood with tissue juices.
3. On all laboratory labels, note whether the specimen is from a skin puncture.
4. Because platelets have a tendency to clump, it is a good idea, particularly if a number of different tests are ordered, to collect the anti-coagulated blood first.
5. Do not stick a baby more than twice to obtain a specimen at any given time.
6. Do not puncture a foot if there are bruises, abrasions, or sloughing skin present. Call this to the attention of the nurse.
7. To help obtain a free-flowing puncture wound from a baby who does not bleed freely, wrap the baby’s heel in a heel warming device for 5 minutes.
8. Use only gentle massage when obtaining blood. Excessive massaging dilutes the blood with tissue fluids and may cause hemolysis.
9. NEVER re-puncture old puncture wounds.
10. NEVER remove a baby from its bassinet or change its position in any way without the approval of a nurse.
11. Age limit for pediatric heel sticks: Pediatrics that are of the age of pulling themselves up on their feet (usually around 6 to 7 months of age) are too old to have heelsticks performed. Fingersticks should be performed at this age and older.
12. Properly secure the puncture site.

PROCEDURE FOR HOLDING THE INFANT FOOT:
When doing a heelstick on an infant, hold the heel gently but firmly. This may be done in one of two ways: (1) place the forefinger around the ankle, and thumb over the arch of the foot or (2) place the forefinger over the arch of the foot and the thumb below the puncture site at the ankle.

13. Use only lancets with a maximum tip length of 2.50 mm. Make the puncture in one continuous, deliberate motion perpendicular to the puncture site. Punctures should be made on the most medial or most lateral portion of the plantar surface (shaded areas in the diagram of an infant’s foot below). It is also recommended that you do not perform skin punctures on the posterior curvature of the heel.

NOTE: The depth of the skin puncture in the heel is important in infants, particularly neonates. It must not exceed 2.5 mm. Penetration of the calcaneus bone, osteomyelitis, and sepsis have all been reported as potential complications.
14. Perform the skin puncture smoothly and quickly. Hold the lancet across the skin grain as this will allow the blood to form in a well rounded drop. If the puncture is made with the grain of the skin then the blood will run along the grains and not form a rounded drop.

15. Maintain the pressure on the site, a needed. Do not hold continuous pressure as this will not allow a free flow of blood to accumulate at puncture site. Apply gently pressure again to form another rounded drop of blood.

16. Wipe the first drop off since excess tissue fluid will dilute and/or cause clumping of the specimen.

17. Collect an adequate sample for each request and follow the correct order for draw.

18. Apply the direct pressure to the site until the bleeding stops. A pressure pad should be applied along with a bootie wrap to aid in the puncture site to clot.

19. If more than one microcollection tube is needed, always collect additive tubes first. Good blood flow is more critical for anti-coagulated specimens than serum specimens. Also, never “scoop” the blood from the surface of the skin. This can cause platelet clumping, which can make a hematology or blood bank specimen unsuitable for analysis. Instead, drops of blood should be allowed to flow freely into the collection top and down the walls of the tube. Clumps or hemolysis in a specimen will cause rejection of the specimen by the laboratory and necessitate a re-draw.

20. Skin puncture blood is neither venous or arterial blood. It is a mixture of blood from arterioles, venules, and capillaries and also contains a small amount of tissue fluid. No clinically important differences are found between skin puncture serum and skin puncture plasma. However, there are important clinical differences between skin puncture blood and venous serum in four constituents - glucose, potassium, total protein, and calcium. Except for glucose, concentrations in venous serum are higher. These differences do not diminish the value of the specimen but indicate that the origin of the specimen must be taken into account when interpreting test results.

21. Osteochondritis, or bone cartilage infections, of the heel of newborns can be complication of skin puncture. To avoid this, follow these guidelines:

   a. Punctures should be made on the most medial or lateral portions of the plantar or flat surface of the heel.
   b. Puncture should NOT be made on the posterior curvature of the heel where the bone is closet to the skin.
   c. Punctures should NOT be made deeper than 2.5 mm.
   d. Punctures should NOT be made through previous puncture sites because hidden infection may be present.

A proper area for heelstick can be determined by imaging a line drawn posteriorly from the middle of the big toe to the heel and another drawn posteriorly from the 4th and 5th toes to the heel. The puncture should be medial to the 1st line or lateral to the 2nd line. The arch is unacceptable due to the potential for tendon, cartilage and/or nerve injury.
QUICKHEEL™ HEELSTICK LANCET

PRINCIPLE:
All QuickHeel instrument are automated producing a standardized surgical quality incision for sampling blood from preemies and newborns.

The skin of humans, especially babies, has unique stress-strain characteristics that results in remarkable skin compression and indentation from even minor pressure. Any pressure from a device on the infant’s heel will indent the skin, causing the skin cells to elongate and compress in a distinct, stratified manner. The degree of skin indentation increases the depth of any wound. If the skin indent is 2.0 mm when using a lancet device that punctures to 2.4 mm, the puncture depth will surpass a hazardous 4.0 mm.

The QuickHeel principle is to assure an incision of uniform depth and length with a large, flat blade-slot surface from which the blade protracts, enabling it to be flush against the child’s heel without undue pressure or skin indentation.

PROCEDURE:
Materials:
- 70% alcohol swabs
- dry gauze
- microcapillary tubes or filter paper

The so-called safe area to inflict a neonatal or infant heel wound is. Marked by line extending posteriorly from a point between the 4th and 5th toes and running parallel to the lateral aspect of the heel, and a line extending posteriorly from the middle of the great toe running parallel to the medial aspect of the heel.

1. Always wear gloves before handling any infant.
2. The ideal posture for this procedure is with the baby in a supine position with the knee at the open end of a bassinet. This allows for the foot to hang lower than the torso, improving blood flow. Place infant heel warming device over the heel for 5 minutes.
3. Clean the incision area of the heel with a 70% alcohol swab. Allow to air dry. Do not touch the incision site or allow the heel to come into contact with any non-sterile item or surface. (See Figure 1)
4. Remove the appropriate QuickHeel device from its blister pack taking care not to rest the blade slot end on any non-sterile surface. (Figure 2)
5. Remove the safety clip (NOTE: The safety clip may be replaced if the test is momentarily delayed; however, prolonged exposure of any QuickHeel device to uncontrolled environmental conditions prior to use may affect its sterility). Once the safety clip is removed, DO NOT push the trigger or touch the blade slot. (See Figure 3)
6. Raise the foot above the baby’s heart level and carefully select a safe incision site (avoid any edematous area or site within 2.0 mm of a prior wound). Place the blade-slot surface of the device flush against the heel so that its center point is vertically aligned with the desired incision site. (See Figure 4)
7. Ensure that both ends of the instrument have made light contact with the skin, and depress the trigger. (See Figure 5)

8. After triggering, immediately remove the instrument from the infant’s heel. Lower the infant’s heel to a position level with or below the baby.

9. Using only **DRY** sterile gauze pad, gently wipe away the first droplet of blood that appears at the wound site. (See Figure 6)

10. Taking care not to make direct wound contact with the collection container or capillary tube, fill to the desired specimen volume. If you are collecting on PKU filter papers, saturate each circled area with the droplets of blood. (See Figure 7)

11. Following blood collection, gently press a dry sterile gauze pad to the incision site until bleeding has ceased. This step will help prevent a hematoma from forming. (See Figure 8)

12. Place pressure pad over the incision site and wrap the foot in a bootie wrap made of a 4x4 gauze.

**CONDITIONS AFFECTING THE PROCEDURE:**

**Heel edema**
**Re-incision of prior wound site**
**Inflamed heel**
**Excessive pressure and skin indentation from placing the instrument on the heel, resulting in a deep and hazardous wound depth.**

**LIMITATIONS OF THE PROCEDURE:**

**Care and proper procedure must always be followed to avoid injury.**
**Poor vascularization may cause inadequate blood flow (NOTE: Warming the heel to 42 degrees will improve blood flow, but temperatures above 44 degrees will burn the heel)**
WHEN TO USE THE QUICKHEEL REGULAR VS. THE QUICKHEEL PREEMIE

QUICKHEEL:
The original QuickHeel makes a standard incision of 2.5 mm in length and 1.0 mm in depth, providing a free-flowing blood specimen at ambient or warm heel temperature. The weight of the Infant should be 6 lbs or the equivalent in kgs. and greater.

QUICKHEEL PREEMIE:
QuickHeel preemie, a modification of the original QuickHeel instrument, provides an incision that is reduced by 40% in area to ensure the safety of smaller pre-term newborns. QuickHeel preemie may also be used for low blood volume sampling from larger, full-term infants. It makes a standardized incision 1.75 mm in length and 0.85 mm in depth. The weight of the infant should be 5 lbs or the equivalent in kgs. and less.

FEATURES AND BENEFITS OF QUICKHEEL

**Standardized lengths and depths of incisions
**Automated blade action
**Surgical steel blade
**Permanently retracting blade
**Flat blade-slot surface
**Safety clip
**Sterile
**Disposable

PEDIATRIC PROTOCOL
(12 Months and Less)

When Phlebotomy personnel is requested to venous stick a pediatric patient less than 12 months of age: the phlebotomist is to attempt the collection, if they feel comfortable that they can collect the specimen. When an attempt of two (2) sticks minimum is made and the phlebotomist fails to collect the specimen, they may request another phlebotomist with more experience to try the venipuncture. If both attempts fail, the phlebotomist is to notify the nursing staff of the unsuccessful collection. For OP, lab may contact Ped’s Department for assistance, and / or contact the patient’s physician for resolution.
PH1.044.04 Line Collection Procedure

1.0 Purpose: Phlebotomy is responsible for the accurate and timely collection of specimens on specified units. Some patients have arterial lines which can be used to obtain blood samples without requiring venipuncture. Phlebotomy does not have the authorization to access arterial or any other direct patient lines. Access can only be obtained by registered nursing staff. In the event a patient has a line from which blood can be obtained, the following procedure will apply.

2.0 Patients with Line Access
2.1 The 3rd shift Phlebotomy Coordinator will send line draw sheets to the floors of laboratory responsibility at the beginning of their shift on a daily basis.
2.2 Each floor will complete the line draw sheet by listing patients with working line access in the appropriate room number on the sheet.
   2.2.1 Patient information to include
      2.2.1.1 Patient Name
      2.2.1.2 Patient Medical Record Number
2.3 Each floor will send the completed Line Draw Sheet to the laboratory by 1:00 am each day.
2.4 Phlebotomist will not be in attendance for patients listed on Line Draw Sheet during blood collections.

3.0 Lab Orders for Patients with Line Access
3.1 All patients with line access will be collected by nursing staff.
   3.1.1 Laboratory will provide common laboratory supplies to obtain appropriate collections from patients with line access.
      3.1.1.1 Tubes Stocked on floor
         3.1.1.1.1 Gold
         3.1.1.1.2 Green – Lithium Heparin
         3.1.1.1.3 Lavender -
         3.1.1.1.4 Pink – Blood Bank orders only
      3.1.1.2 Supplies Stocked on floor
         3.1.1.2.1 10ml Syringes
         3.1.1.2.2 Transfer Device (transfer blood from syringe to appropriate tube).
   3.1.2 Laboratory Supplies Storage Location
      3.1.2.1 6W – Nurses Station
      3.1.2.2 7E – Medication Room
      3.1.2.3 7W – Medication Room
      3.1.2.4 8E – Medication Room
      3.1.2.5 8W – Medication Room
      3.1.2.6 10E – Medication Room
      3.1.2.7 10W – Medication Room
   3.1.3 Other collection supplies should be requested from laboratory if appropriate for line collection.
3.2 Labels for Timed laboratory tests print two (2) hours prior to scheduled collection. Printed laboratory labels will be delivered to appropriate designee on each floor by the assigned phlebotomist.
3.3.1 6W – Unit Secretary
3.3.2 7E – Charge Nurse
3.3.3 7W – Charge Nurse
3.3.4 8E – Charge Nurse
3.3.5 8W – Charge Nurse
3.3.6 10E – Charge Nurse.
3.3.7 10W – Charge Nurse

3.3 All STAT and ASAP orders collected by line access will be labeled with patient’s chart labels.

3.3.1 The Coordinator will call the Charge Nurse with each STAT and ASAP order.

3.3.2 Laboratory labels will be tubed to the unit upon Charge Nurse request.

4.0 Inaccessible Lines

4.1 When lines are no longer accessible, the patient’s nurse will contact the Phlebotomy Coordinator at 434-4650 to inform the lab that venipuncture will need to be performed until further notice.

4.1.2 The phlebotomist will document on the Line Draw Sheet the request for venipuncture on all laboratory orders until further notice.

4.1.2.1 The phlebotomist will document the name of the calling nurse and time of call.

4.2 All orders received after notification of inaccessible lines, will be collected by a phlebotomist via venipuncture.

Initial Author/Date: Karen Sullivan, August 14, 2006

Revised by: Paula Lundy, May 26, 2009
Paula Lundy, July 9, 2010
Paula Lundy, March 31, 2011
PH1.014.05 NEEDLELESS TRANSFER SYSTEM

1.0 **Principle:** This system has been devised to assure a safe transfer of blood using a syringe collection method to a vacutainer tube. It is to protect the health care worker from needlesticks and exposure to HIV and HBV. It is an approved OSHA methodology and has been instituted through Palmetto Health Richland under the guidance of the Nursing Safety Coordinators.

2.0 **Equipment:**
   2.1 Syringe
   2.2 Syringe needle protection device
   2.3 BD Blood Transfer Device
   2.4 Vacutainer Tubes

3.0 **Procedure:** ***Wear Gloves At All Times***
   3.1 Prepare the Needleless Transfer System before beginning the venipuncture procedure to ensure specimen integrity.
   3.2 After venipuncture is performed and the venipuncture site has been dressed, the safe transfer of blood from the syringe to vacutainer tube is needed. The collection person/phlebotomist must work quickly to prevent micro-clots from forming.
   3.3 Safety lock the syringe needle with the protection device and remove from syringe.
   3.4 Dispose of the needle in the biohazard sharps container.
   3.5 Attach the syringe to the BD blood transfer device.
   3.6 Follow the **Order of Draw** before transferring blood.
   3.7 Place vacutainer tubes in the holder and push to penetrate the needle through the rubber stopper.
      3.7.1 Aliquot blood as appropriate to the tests needed.
      3.7.2 Change vacutainer tubes as needed (tubes will fill automatically).
   3.8 Label tubes appropriately.
   3.9 Dispose of Needleless Transfer device in biohazard sharps container.

Initial Author, Date J. Dixon, July 9, 1995

Revised by: Rachele Bosley, November 12, 1998
            Dee Dailey, July 6, 2001
            Paula V. Lundy, July 23, 2008
            Paula V. Lundy, February 26, 2010
UNACCEPTABLE SPECIMEN PROTOCOL

BLOOD SPECIMENS

Acceptable: Positive patient ID requires the matching of a patient armband with a lab label / collection list / Cerner list with pt full name, MR#, and account # where applicable.
All blood specimens are to be received in the lab properly labeled with complete patient information.

This is to include:
1-the patient’s full name
2-unit record / MR number
3-time of specimen collection
4-date of specimen collection
5-initials or tech number of person collecting specimen.

Unacceptable:
I. If a blood specimen is improperly labeled, i.e.:
   a-name only
   b-incorrect unit record / MR number
   c-wrong name and unit record number
   d-no labeling information at all

The specimen will be rejected and a request for a new specimen will be initiated.

In the event the specimen cannot be recollected due to the time frame or difficulty of obtaining a new specimen (see recollection protocol), the patient’s physician MUST be notified by the nurse in charge. The unit who performed the original collection will have to come to the laboratory and correctly label the specimen and documentation MUST be performed with the person’s signature making the correction. Documentation will be made in the Laboratory Sunquest Computer stating the specimen was relabeled.

NOTE: See Lab Policy per Relabelling of CRUCIAL Specimens.

SPECIMEN WILL NOT BE SENT BACK TO THE UNIT FOR CORRECTION.

II. Blood tubes have cracks or have been broken in transit.

Specimen recollections will be requested.

III. Blood specimens have not met special draw requirements causing inaccurate results.
    Special draw requirements means:
    a. not placed on ice
    b. not delivered to the lab in a designed time frame for that test
    c. collected in a improper tube/anticoagulant, etc.

A recollection will be requested.

Processing Outreach Specimens

Purpose:
Specimens received from outside areas are to be centrifuged before they are brought to the laboratory. In the event that the specimens are not properly centrifuged, special precautions must be taken to ensure sample integrity and accurate testing. The technical staff should be alerted.

**URINE SPECIMENS**

Acceptable:
All urine specimens are to be received in the lab in a sealed biohazard bag. Urine specimens are to be **completely** labeled with:
1. patient’s full name
2. unit record / MR number
3. physician

4. **TESTS DESIRED WRITTEN ON THE LABEL**
The addressograph label is acceptable.

Specimens will be accepted in a tightly sealed urine cup or a syringe that has been capped off. All 24 hour urine specimens **MUST** have complete patient information written on the container to match the request form as well as completion of test request form information for time and date of start and completion and patient’s height and weight for creatinine clearance requests.

Unacceptable:
I. Any urine container that is sent to the lab leaking in the bag will be rejected. A recollect will be requested.
   If a recollect is not possible, the unit will be notified and a unit employee will be responsible for cleaning the specimen container making it suitable for handling.

II. Any urine syringes received with needles attached will be rejected. Either a recollection must be performed or a unit employee will have to come to the lab making the specimen suitable for handling.

III. Any urine sample sent to the lab mislabeled will be discarded. The unit will be notified prior to discard and documented. In the event a urine sample can not be obtained on the patient, the same protocol will apply as with the blood specimen on re-labeling the specimen.

IV. Any urine specimen received in the lab with no patient information will be discarded. Documentation **MUST** be kept in the event a call comes to the department inquiring about results.
Effective Date: 03/14/2012

**PH1.027.10 BacT/Alert® Blood Culture Collection**

1.0 Purpose: Blood Cultures are collected whenever the physician has reason to suspect clinically significant bacteremia, are one of the most important cultures performed in the Microbiology Department. Blood Cultures help to indicate the severity and extent of spread of an infection. They provide for the identification and antimicrobial susceptibility of the etiological agent causing a severe or life-threatening disease. Therefore, the technique and procedure used in the collection and processing of these specimens are important for proper patient care.

2.0 Skin Antisepsis (Skin Cleanliness):

2.1 The most important procedure during the collection process is proper skin antisepsis. Although variable from person to person, many bacteria, both gram positive and gram negative, are present on the skin.

2.1.1 Gram-negative organisms are less common inhabitants on normal, healthy skin but are not uncommon on the skin of hospitalized patients or hospital personnel.

2.1.1.1 There is a high risk of blood culture contamination from the skin of the patients and from the skin of the collecting phlebotomist.

2.1.1.2 The significance of these organisms, although usually nonpathogenic in nature, may be difficult to establish when they are isolated from a blood culture because of their role in causing endocarditis from implanted prosthetic material infections.

2.2 The laboratory must report all microorganisms isolated from the blood cultures.

2.3 The physician must interpret the report and decide whether the isolate is clinically significant or whether the isolate is a contaminant.

2.3.1 If the isolate is interpreted as clinically significant, a designated treatment protocol is indicated.

2.3.2 The patient could be committed to additional hospitalization for treatment at considerable expense and some risk because of possible adverse toxic effect due to antibiotics.

2.4 The role the phlebotomist, by his/her expertise or lack of it, either contributes to the patient's welfare or possibly causes misleading information to be reported.

3.0 Equipment

3.1 BacT/Alert® Blood Culture Bottles

3.2 Butterfly Collection Set (with luer adapter and holder) or Syringe System (BD)

3.3 ChloraPrep® One-Step 1.5 ml Frepp® Applicators (Medi Flex)

3.4 70% Alcohol Pads

3.5 PPE: All proper PPE to include gloves, gowns and masks (if applicable),

4.0 Reagents

4.1 **ChloraPrep® One-Step 1.5 ml Frepp® Applicators**

4.1 Chlorhexidine gluconate 2% (w/v) and Isopropyl alcohol 70% (v/v)

4.2 **Warnings**

4.2.1 For external use only.

4.2.2.1 Flammable: Keep away from fire or flame.
4.2.2.2 Do not use on children less than 2 months of age because of the potential for excessive skin irritation and increased drug absorption.

4.2.2.3 Do not use on patients with known allergies to chlorhexidine gluconate or isopropyl alcohol.

4.2 BacT/Alert® PF (Pediatric: Yellow) Ingredients and Volume:

   4.2.1 Complex Media 16 ml
   4.2.2 8.5% Charcoal Suspension 4 ml
   4.2.3 Soybean-Casein Digest 2.00% w/v
   4.2.4 Brain Heart Infusion Solids 0.1% w/v
   4.2.5 Sodium Polyanetholesulfonate 0.025% w/v
   4.2.6 Pyridoxine HCl 0.001% w/v
   4.2.7 Menadione 0.0000625% w/v
   4.2.8 Hemin 0.0000625% w/v
   4.2.9 L-Cysteine 0.025% w/v

4.3 BacT/Alert® FA (Aerobic: Pale Green) Ingredients and Volume:

   4.3.1 Complex Media 22 ml
   4.3.2 6.5% Charcoal Suspension 8 ml
   4.3.3 Soybean-Casein Digest Broth 2.0% w/v
   4.3.4 Brain Heart Infusion Solids 0.1% w/v
   4.3.5 Sodium Polyanetholesulfonate 0.05% w/v
   4.3.6 Pyridoxine HCl 0.001% w/v
   4.3.7 Menadione 0.0000725% w/v
   4.3.8 Hemin 0.0000725% w/v
   4.3.9 L-Cysteine 0.03% w/v

4.4 BacT/Alert® FN (Anaerobic: Orange) Ingredients and Volume:

   4.4.1 Complex Media 32 ml
   4.4.2 8.5% Charcoal Suspension 8 ml
   4.4.3 Soybean-Casein Digest Broth 2.0% w/v
   4.4.4 Brain Heart Infusion Solids 0.1% w/v
   4.4.5 Sodium Polyanetholesulfonate 0.044% w/v
   4.4.6 Pyridoxine HCl 0.001% w/v
   4.4.7 Menadione 0.0000625% w/v
   4.4.8 Hemin 0.0000625% w/v
   4.4.9 L-Cysteine 0.025% w/v

5.0 BacT/Alert Blood Culture Bottle Warnings

5.1 Prior to use, each vial should be examined. Do not use Bottles if you observe any of the following:

   5.1.1 Damage or deterioration (discoloration)
   5.1.2 Contamination such as cloudiness
      5.1.2.1 A contaminated vial could contain positive pressure.
      5.1.2.2 If contaminated vial is used for direct draw, gas or contaminated culture media could be refluxed into the patient’s vein.
   5.1.3 Excessive gas pressure (bulging septum)
   5.1.4 Leakage
      5.1.4.1 If spillage or leakage occurs after the vial has been inoculated, treat the leak or spill with caution as pathogenic organisms/agents maybe present.
   5.1.5 Always check expiration date before collection. Never use expired
bottles for patient collection.

5.1.6 Observe the bottom of each bottle before use.
5.1.6.1 Do not use bottle if the bottom disk displays a yellow fluorescence. The yellow fluorescence indicates bottle contamination.

6.0 Procedure
6.1 Preparation of Site. The site or source of blood collection influences the contamination rate of blood cultures. Cultures of blood from the umbilical or femoral vein are more likely to be contaminated than are those of blood from the antecubital vein. Indwelling intravascular catheters become colonized with bacteria when left in place for longer than 48 hours. Cultures of blood taken from such catheters are more likely to become contaminated than are those of blood collected by percutaneous venipuncture.

6.1.1 An antiseptic agent (Chloraprep) requires at least 1 to 2 minutes before they exert any significant activity against most skin bacteria.
6.1.2 The Chloraprep must be allowed to completely air dry.
6.1.3 Once the venipuncture site has been prepared aseptically, it should never be touched unless the fingers used for palpitation have also been disinfected (in the same manner as the venipuncture site).

6.2 Preparation of BacT/Alert Bottles
6.2.1 Remove the plastic flip top from culture bottle and disinfect with an alcohol pad. Do not use betadine.

6.3 Method of Specimen Collection
6.3.1 Blood can be drawn with a butterfly transfer set consisting of sterile tubing with a needle at either end. This is the recommended Collection Process.

6.3.1 Blood can be drawn with a sterile needle and syringe.

6.4 Specimen Collection – Butterfly
6.4.1 Wash hands thoroughly and don gloves.
6.4.2 Identify the patient with the full name and medical record number.
6.4.2.1 Step 4 may be done before Step 2. While you prepare your equipment the Chloraprep may be given the appropriate amount of time to air dry.
6.4.3 Assemble and prepare the equipment.
6.4.4 Perform AIDET (Acknowledge, Introduce, Duration, Explanation and Thank you)
6.4.5 Pinch the wings on the Chloraprep scrub applicator to break the ampule and release the antiseptic.
6.4.4.1 Do not touch the sponge.
6.4.4. Wet the sponge by pressing and releasing the sponge against the venipuncture site until liquid is visible on the skin.
6.4.6 Apply Chloraprep with back and forth strokes of the applicator for 2 minutes to thoroughly disinfect the selected site.
6.4.7 Allow the area to air dry for approximately 60 seconds. Do not blot or wipe away.
6.4.8 Reapply tourniquet without touching the venipuncture site. Place the patient’s arm in a flat position on a solid surface.
6.4.9 Without touching the site, pull tight on the skin and insert the needle from the butterfly with luer adapter and tube holder (bevel up) into the vein.
6.4.10 Once blood begins to flow through the rubber tubing, attach bottles (pale green aerobic bottle first) to the holder to collect the blood.

6.4.10.1 Blood culture bottle must remain in an upright position to prevent reflux of reagent into patient.

6.4.10.2 Maintain control of the luer connector by securing it between the thumb and forefinger.

6.4.11 Blood culture bottles are filled directly using the needleless adapter, not allowing any broth from the bottle to contaminate the butterfly line.

6.4.12 Remove needle from the vein smoothly and apply pressure.

6.4.13 Label each bottle with a barcode label, collection time, and collector identification.

6.4.13.1 Do not place labels over barcode on bottles!

6.4.13.2 Use the clear area length wise to place patient label on.

6.4.13.3 Include the site of collection on the label.

6.4.14 Check site to ensure bleeding has stopped and apply pressure bandage.

6.4.15 Discard collection device in sharps container and all other supplies in trash.

6.4.16 Wash hands thoroughly.

6.4.17 Blood Culture specimens are sent to Specimen Processing to be received and delivered to Microbiology.

6.5 Specimen Collection Syringe (with butterfly or syringe needle)

6.5.1 Follow steps 6.4.1 through 6.4.8

6.5.2 Without touching the site, pull tight on the skin.

6.5.3 Insert the needle (bevel up) into the vein and fill syringe

6.5.4 Remove needle smoothly from arm and activate safety device

6.5.5 Apply pressure

6.5.6 Attach needleless transfer device to syringe

6.5.7 Fill Blood Culture bottle (Orange Anaerobic bottle first to prevent oxygen entering the bottle – only if maximum quantity is collected)

6.5.8 Add tube holder adapter to fill other blood tubes using correct blood draw order as outlined in Order of Draw.

6.5.9 Follow steps 6.4.13 through 6.4.17

6.5.10 Fungal and AFB Blood Cultures can not be collected by this method. Continue to use the Isolator Tubes for Fungal and AFB. See Isolator Fungal/AFB Procedure.

7.0 Collection Requirements

7.1 Adult Requirement

7.1.1 Collect one Pale Green (Aerobic) and one Orange (Anaerobic) bottle for each culture ordered.

7.1.1.1 Insert 8 – 10 mls of blood to each bottle. Do not deviate from these volumes. Volumes less than the recommended amount may compromise organism recovery.

7.1.1.2 If your patient is a difficult draw and can only obtain a small amount of blood, please place the collection in the pale green Aerobic bottle only. Must be at least 5 mls.

7.2 Pediatric Requirements

7.2.1 Collect one Yellow pediatric bottle for each culture ordered.
7.2.1.1 Insert 4 mls of blood into the pediatric bottle.
7.2.1.2 If your patient is a difficult draw and can only obtain a small amount of blood, please place a minimum of 2 mls in the yellow pediatric bottle.
7.2.1.3 For Neonate to 1 year old weighing <4kgs: 0.5 to 1.5 ml is acceptable.

8.0 Labeling
8.1 Label each bottle with a barcode label, collection time and collector identification. Do not place labels over barcode on bottles! Use the clear area length wise to place patient labels.

9.0 References
9.1 Package Insert BacT/Alert®, bioMerieux, S. A., December 2007
9.2 Clinical and Laboratory Standards Institute, H3-A6 Procedure for the Collection of Diagnostic Blood Specimens by Venipuncture; Sixth Edition

Initial Author/Date: J.Dixon July 26, 1995
Revised by: Dee Dailey Aug 5, 1997
            Rachele Bosley Nov 24, 1998
            Kendal Ringer Aug 7, 2003
            Angela McCrea Aug 1, 2005
            Angela McCrea Dec 22, 2005
            Paula Lundy Nov 3, 2006
            Paula Lundy Mar 14, 2008
            Paula Lundy February 26, 2010
            Toni Aversa March 14, 2012
FUNGAL/AFB BLOOD CULTURE COLLECTION

PRINCIPLE:

Fungal/TB cultures, collected whenever the physician has reason to suspect clinically significant fungal or tuberculin infections, are two of the cultures performed in the Microbiology Department.

EQUIPMENT:

Isolator Blood Culture Tubes

Preparation of Site:

“Instant” antisepsis does not occur regardless of which antiseptic agent is used. An agent requires at least 1 to 2 minutes before they exert any significant activity against most skin bacteria. It is therefore important to allow the betadine to completely dry. Once the venipuncture site has been prepared aseptically, it should never be touched unless the fingers used for palpation have also been disinfected (in the same manner as the venipuncture site). Fungus/TB contamination is usually not found on the surface of the skin, however, this test is usually collected in conjunction with routine blood cultures where skin antisepsis is crucial.

Preparation of the Isolator Tube:

Cleanse with iodine sepsis. Do not allow iodine to pool in the cavity of the stopper. Allow to dry. The following methods are acceptable for specimen collection:

1. Blood can be drawn with a sterile needle and syringe.
2. Blood can be collected with a transfer set consisting of sterile tubing with a needle at either end.
3. Blood can be collected in Isolator tubes that fit into tube holders used for routine venipunctures if a fungal or TB culture is the only culture that is being collected.

**Do not use this method with the Bactec Procedure.**

PROCEDURE:

1. Identify the patient with full name and MR identification number.

NOTE: Step 4 may be done before Step 2 so the alcohol and iodine may be given the appropriate amount of time to dry.

2. Assemble and prepare equipment.

3. Apply tourniquet and select venipuncture site, then loosen.

4. Prepare site by using alcohol wipe, scrub site for one minute allowing to air dry. Pop vial to release iodine solution. Apply in a circular motion beginning at the center and moving your way out, cleaning for 2 minutes. Discard prep. Allow to air dry for 1-2 minutes (do not blow, fan, or wipe off with gauze or alcohol). Do not touch or contaminate the site before venipuncture.
DO NOT TOUCH PREPARED SITE WITH UNSTERILE FINGERS. If it is necessary to palpate the site before venipuncture, cleanse the finger with iodine solution in same manner as site preparation and allow to air dry.

5. Reapply tourniquet, place patients arm in a **downward position** and draw volume of blood needed from patient using the syringe method, vacutainer method or the Butterfly method.  

**DURING THE COLLECTION PROCEDURE, DO NOT PERMIT THE CONTENTS OF THE TUBE TO CONTACT THE YELLOW STOPPER IN ORDER TO AVOID THE POSSIBILITY OF BACKFLOW OF REAGENTS FROM THE TUBE WITH THE ATTENDANT POSSIBILITY OF ADVERSE PATIENT REACTION.**

NOTE: Order of Draw:
- Remember to always draw culture tubes first then collect reds, blue, purple if needed in this sequence.

6. If using the syringe method, it is not necessary to change the needle to a clean needle. If good sterile technique was used in preparing the skin the needle should be bacteria free.

NOTE: The change in this procedure is to eliminate the hazard of employees sticking themselves while changing syringe needles. Recapping is against the infection control and safety policy at this hospital.

**Requirements for Volume and Delivery to Microbiology:**
- **FNBC:** Adult: Minimum of 5cc of blood up to 10cc.  
  Pediatric: Minimum of 1 cc of blood up to 1.5cc.  
- **AFB:** Same as for fungal

7. Specimens are brought to Specimen Processing to be received and delivered to Microbiology or may be sent via the pneumatic tube system directly to the Microbiology Dept.

**MOLECULAR PATHOLOGY SPECIMENS**

**COLLECTION OF SPECIMENS FOR MOLECULAR PATHOLOGY SPECIMENS**

**CHLAMYDIA AND N. GONORRHOEAE**  
**(BD PROBETEC METHOD)**

**Note:** **USE ONLY THE SWABS SUPPLIED IN THE COLLECTION KIT**

The unopened collection kit may be stored at room temperature until expiration date.

**ENDOCERVICAL SAMPLE**
1. Remove excess mucus with cleaning swab and **discard this swab**.
2. Insert the female endocervical swab into the cervical canal and rotate for 15-30 seconds.
3. Withdraw collection swab and see **Preparation for Transport below**

**URETHRAL SAMPLE**
1. Insert the male urethral swab 2 to 4 cm into urethra. Rotate clockwise for 3 to 5 seconds to
ensure contact with all urethral surfaces.

2. Withdraw collection swab and see Preparation for Transport below

CONJUNCTIVAL SAMPLE
1. Use sterile swab to clean away any discharge present. Do not scrape the conjunctiva while cleaning.
2. If both eyes are affected, swab the lower affected eye first.
3. Thoroughly swab the lower then upper conjunctiva two to three times each with the supplied swab.
4. Withdraw collection swab and see Preparation for Transport below

URINE SAMPLE
1. Patient should not urinate one hour prior to collection of specimen.
2. Collect 10-15 mL of first catch urine (the first part of the stream) in a sterile, plastic, preservative free specimen collection cup.
3. Seal the specimen container and label with patient information.
4. Transport unpreserved urine at 2-8 degrees C.
5. Urine samples may be aliquotted into Urine Preservative Transport Kit (UPT) by using the transfer pipet provided to aspirate urine from container into the UPT.
6. Fill UPT between the black lines on the fill window located on the UPT label.
7. Transport samples in UPT at 2-30 degrees C.

PREPARATION FOR TRANSPORT
1. Fully insert collection swab into the CT/GC diluent tube.
2. Break the shaft of the swab at the score mark. Use care to avoid splashing of contents.
3. Cap tube tightly and label tube with patient information.
4. Transport to laboratory at 2-27 degrees C.
5. DO NOT REMOVE SWAB FROM TUBE.

THIN-PREP SPECIMENS FOR CHLAMYDIA/ N. GONORRHOEAE
NOTE: use only Cytyc PreservCyt Solution ThinPrep media

The Patient’s gynecologic sample is collected by the clinician using either a broom type collection device or cytobrush/spatula combination cervical sampling device which is rinsed in a vial of PreservCyt Solution. The PreservCyt sample is then tightly capped, labeled, and sent to the laboratory for testing. The storage limit for cells in PreservCyt Solution is 3 weeks at 4 oC to 37º.

BODY FLUIDS AND GENITAL SPECIMENS FOR PCR TESTING

Tests for PCR on body fluids include the codes HSV DNA by PCR (HSPCR). All body fluids should be collected in sterile, well-stoppered tubes. Swabs collected for HSV DNA testing should be inoculated into transport media (M4 media). Collect grossly bloody, or specimens prone to clotting in Lavender top EDTA tubes. Place samples on ice and transport to the laboratory as soon as possible for processing.

PERIPHERAL BLOOD SPECIMENS FOR PCR TESTING
Tests for PCR on peripheral blood include the codes HSV DNA by PCR (HS PCR), Factor V Leiden Mutation (F5LD), Prothrombin Gene Mutation (PGM), Methylene tetrahydrofolate Reductase (MTHFR) and HIV DNA qual (HIVDN). Blood specimens should be collected in one 2 ml EDTA Lavender top tubes. Place on ice and transport to the laboratory as soon as possible for processing. For HIV DNA testing on pediatric patients, two full lavender microtainers are required. Ensure specimens are not clotted.

**RESPIRATORY SPECIMENS FOR PCR TESTING**

Tests for PCR include the code Bordetella Pertussis/Parapertussis (BORPC). **Nasal swabs** are the only acceptable source for this test. Copan E-swab are available in supply and can be ordered by using PMM #29510.

**PERIPHERAL BLOOD SPECIMENS FOR HIV Viral Load/HCV Genotype TESTING**

For HIV-1 viral load (HIVBD) and HIV-1 Genotype (HIVG), collect blood in 2 White Top, PPT (preferred). Transport sample at room temperature **immediately** to the laboratory. Specimens with prolonged transport times may be rejected due to strict processing guidelines.

**PERIPHERAL BLOOD SPECIMENS FOR HCV Viral Load TESTING**

For Hepatitis C RNA Viral Load testing (HCVB) and Hepatitis C Genotype testing (HCVG), collect blood in 1 White Top, PPT (preferred). Two 2 ml lavender tubes may also be used. Transport sample at room temperature **immediately** to the laboratory. Specimens with prolonged transport times may be rejected due to strict processing guidelines.

**THIN-PREP SPECIMENS FOR HUMAN PAPILLOMAVIRUS (HPV), HIGH RISK**

**NOTE:** use only Cytyc PreservCyt Solution ThinPrep media

The Patient’s gynecologic sample is collected by the clinician using either a broom type collection device or cytobrush/spatula combination cervical sampling device which is rinsed in a vial of PreservCyt Solution. The PreservCyt sample is then tightly capped, labeled, and sent to the laboratory for testing. The storage limit for cells in PreservCyt Solution is 18 weeks at room temperature (20-30°C).

**TISSUE SPECIMENS FOR FLOW CYTOMETRY**

All tissue specimens for Flow Cytometry must be placed in RPMI media in 15 mL conical tubes. These are available in the Histology Labs as well as the Molecular Pathology Laboratory. **THESE SPECIMENS MUST BE KEPT AT REFRIGERATOR TEMPERATURE.** Call Molecular Pathology at 434-4980 and if necessary leave a message that a specimen is to be picked up as soon as possible. All testing must be started within 24 hours after collection of the sample. **NOTE: Do not tube these samples.**

Test codes: LYMOP and ACLKP
BLOOD AND BONE MARROW SPECIMENS FOR FLOW CYTOMETRY

All specimens of these types MUST BE KEPT AT ROOM TEMPERATURE. Collect at least one 2ml Lavender or Sodium Heparin (green) tube or one Heparinized syringe. Samples should be placed on the rocker in Hematology. Call Molecular Pathology (Flow Cytometry) at 434-4980 to inform the technologist that a specimen needs to be picked up as soon as possible. All testing must start within 24 hours after collection of sample. NOTE: Do not tube these samples. Test codes: LYMOP, ACLKP

PERIPHERAL BLOOD SPECIMENS FOR CD4, T-HELPER/SUPPRESSOR, LYMPHOCYTE ENUMERATION PANEL (LEPB), AND FETAL HEMOGLOBIN

Collect in one 2 ml lavender tube. Tubes should be placed on the rocker in Hematology. Call Molecular Pathology (Flow Cytometry) at 434-4980. Test codes: CD4, THSB, LEPB, FHB
PHR INPATIENT TESTING ONLY
ORAL GLUCOSE TOLERANCE TESTING
for ADULT PATIENTS GUIDE
(2 hr GTT and 3 hr GTT)

NOTE: This is not the screening test commonly known as 1 hour GTT or Gestational Diabetes Screening Test. The physician may order a 2 hour GTT for non pregnant patients or a 3 hour GTT for pregnant patients. Testing is NOT to be PERFORMED with a GLUCOMETER.

SPECIAL PATIENT INSTRUCTIONS:

1. Recommend testing be performed in the am.
2. No intake of food for at least 8 hours and not more than 16 hours preceding test.
3. Medications known to affect glucose tolerance should be stopped by patient’s physician at least 3 days prior to test. These include hormones, oral contraceptive drugs, diuretics, salicylates and all nonessential medications. Oral anti-diabetes agents should be discontinued for at least 2 weeks.
4. Patient should avoid coffee, smoking, and unusual physical exercise for at least 8 hrs. prior to test.
5. Test should not be done in event of illness: fever, gastritis.
6. Patient must fast during testing.
7. Patient should avoid physical exertion, emotional stress, and stimulants (tobacco, alcohol, coffee, tea) during testing.
**Effective Date: 5-16-2011**

**CCH2.402.11 ORAL GLUCOSE TOLERANCE TEST**

1.0 **Principle**

1.1 The oral glucose tolerance test, commonly known as OGTT, is a serial measurement of glucose before and after a specific amount of glucose is given orally.

1.2 The OGTT should be scheduled to begin in the morning as glucose tolerance exhibits a diurnal rhythm with a significant decrease in the afternoon.

1.3 In a normal patient, glucose will return to the fasting level by 90 minutes and to the subfasting level by 2 hours, returning to fasting level by 3 hours.

1.4 The 2 hour OGTT identifies people with either Impaired Fasting Glucose (IFG) or impaired glucose tolerance (IGT).

1.5 In the absence of unequivocal hyperglycemia, a positive 2 hour OGTT should be confirmed on a subsequent day with a Fasting Plasma Glucose (FPG), a Casual Plasma Glucose or a 2 hour OGTT.

1.6 The 3 hour OGTT identifies pregnant women with Gestational Diabetes Mellitus (GDM).

2.0 **Definitions**

2.1 Two hour glucose tolerance test (GTT2)

2.1.1 Is used to evaluate non-pregnant patients for Type 2 Diabetes Mellitus.

2.1.2 Tests included: Fasting Glucose (GLF) and a 2 hour Glucose (GLU2)

2.1.3 The standard dose for children is 1.75 grams of glucose per kilogram of body weight, to a maximum dose of 75 grams.

2.2 Two hour glucose tolerance test for Outreach (GTT2O)

2.2.1 Is used to evaluate non-pregnant patients for Type 2 Diabetes Mellitus.

2.2.2 Ordered when 3 tubes are received in the Outreach Department

2.2.3 Tests included: Fasting Glucose (GLF), 1 hour Glucose (GLU1) for which the ADA has no recommended reference ranges, and 2 hour Glucose (GLU2).

2.3 Three hour glucose tolerance test (GTT3P)

2.3.1 Is used to evaluate pregnant females for gestational diabetes mellitus.

2.3.2 Tests included: a Fasting Glucose (GFAST), a 1 hour Glucose (GL1), a two hour Glucose (GL2), and a three hour Glucose (GL3)

2.3.3 Gestational Diabetes Mellitus: glucose intolerance with onset or first recognition during pregnancy. Diabetic women who become pregnant are not included in this category.

2.3.4 Diabetes Mellitus: a group of metabolic disorders of carbohydrate metabolism in which glucose is underutilized, producing hyperglycemia.

3.0 **Instructions for Patient**

3.1 Medications known to affect glucose tolerance should be stopped by patient's physician at least 3 days prior to test.

3.2 Testing should be performed between the hours of 0700 and 0900.

3.3 Perform after 3 days of unrestricted diet (containing at least 150 g of
carbohydrate/day) and activity.

3.4 Perform the test after an 8-14 hour fast only in ambulatory subjects who should remain seated during the test without smoking cigarettes.

3.5 Should not be performed on hospitalized, acutely ill, or inactive individuals.

3.6 During test:

3.6.1 Patient should not eat during testing (water is allowed).
3.6.2 Patient should avoid physical exertion, emotional stress, and stimulants (tobacco, alcohol, coffee, tea) during testing.

4.0 Specimen

4.1 Specimen should be centrifuged to separate immediately as glucose level decreases rapidly in whole blood.

4.2 Lithium heparin plasma from a venous collection should be used and the specimen type should remain constant throughout the test.

4.3 Capillary specimens are not recommended.

5.0 Required Supplies

5.1 GTT2 and GTT2O
5.1.1 Glucola 75g bottle
5.1.1.1 See 6.3.2.1 below for pediatric patient
5.1.2 Venipuncture supplies

5.2 GTT3P
5.2.1 Glucola 100g bottle
5.2.2 Venipuncture equipment

6.0 Procedure

6.1 Identify patients following lab procedure PH1.006

6.2 GTT3P orders:

6.2.1 Verify that the patient is pregnant

6.3 GTT2 and GTT2O orders:

6.3.1 Verify that the patient is NOT pregnant

6.3.2 Determine the age of the patient.

6.3.2.1 Pediatric patients (Patients less than 83 lbs)

6.3.2.2 The correct dosage of Glucola is 1.75 grams of glucose per kg of body weight and is calculated as follows:

6.3.2.2.1 Find the weight of the child in pounds (lbs).
6.3.2.2.1.1 Convert lbs to kgs by dividing lbs by 2.2 (2.2 lbs = 1 kg)
6.3.2.2.1.2 Calculate dosage by multiplying body weight in kg X 1.75
6.3.2.2.1.3 Convert grams of glucose to Ounces by dividing by 10

Example: 35 lb child
35 lb divided by 2.2 = 15.9 kg
15.9 kg body weight x 1.75 grams glucose = 28 grams glucose
28 grams divided by 10 = 2.8 ounces glucola
6.4 Perform venipuncture to obtain fasting glucose specimen in a Lithium Heparin green top tube.

6.5 Give patient proper amount of chilled Glucola on ice with a straw:
6.5.1 Non-Pregnant Adults: 75g (whole bottle of 75g)
6.5.2 Pregnant Adult Female: 100g (whole bottle of 100g)
6.5.3 Children: See above to determine appropriate number of ounces to be given

6.6 Document the time the patient takes the first swallow
6.6.1 The patient should drink the full amount within 5 minutes of starting to drink.
6.6.2 Write proper collections times down on labels
6.6.2.1 1 hour: 1 hour from 1st swallow of glucola
6.6.2.2 2 hour: 2nd hour from 1st swallow of glucola
6.6.2.3 3 hour: 3rd hour from 1st swallow of glucola

6.7 Collect the next glucose specimens at the appropriate time and label per policy PH1.005

6.8 Deliver sample to Specimen Processing for receipt and prompt centrifugation

6.9 Sample once received can be placed on to the track system

6.10 Centralink order will appear as seen in 8.2.3

7.0 Safety Precautions

7.1 If during testing patient suffers nausea, fainting, sweating or other symptoms, the pathologist on Clinicals is to be notified immediately.

7.2 Test will be discontinued after physician is consulted if needed.

7.3 In the case that the tolerance is canceled, patient may need to be given something to eat or drink before leaving the lab.

8.0 Sunquest Entry of Results

8.1 Online Entry
8.1.1 Function: OEM
8.1.2 Device: BA1 or BA2
8.1.3 Results will upload with a separate cid for each collection

8.2 Manual Entry
8.2.1 Function: MEM
8.2.2 Worksheet: RC or RCS
8.2.3 Test: Enter the appropriate test code for the collection
8.2.3.1 GTT2: Enter GLF or GLU2
8.2.3.2 GTT2O: Enter GLF, GLU1 or GLU2
8.2.3.3 GTT3P: Enter GFAST, GL1, GL2 or GL3
8.2.4 Enter Result
8.2.5 Verify CID is appropriate for the time of collection, name of patient, and accuracy of result
8.2.6 Reject result if changes need to be made. Do not choose M to modify entries.
8.2.7 Choose A to accept results
9.0 Reference Ranges and Panic Values

<table>
<thead>
<tr>
<th>Reference Range</th>
<th>Panic Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTT2 and GTT2O:</td>
<td></td>
</tr>
<tr>
<td>GLF (mg/dL)</td>
<td>70-99 Normal</td>
</tr>
<tr>
<td></td>
<td>100-125 Impaired</td>
</tr>
<tr>
<td></td>
<td>&gt;= 126 Provisional Diagnosis of Diabetes</td>
</tr>
<tr>
<td>GLU1 (mg/dL)</td>
<td>GLU1C = No ADA recommended reference range for 1 hour glucose in non-pregnant patients</td>
</tr>
<tr>
<td>GLU2 (mg/dL)</td>
<td>70-139 Normal</td>
</tr>
<tr>
<td></td>
<td>140-199 Impaired</td>
</tr>
<tr>
<td></td>
<td>&gt;= 200 Provisional Diagnosis of Diabetes</td>
</tr>
<tr>
<td>GTT3P:</td>
<td></td>
</tr>
<tr>
<td>GFAST (mg/dL)</td>
<td>70-95</td>
</tr>
<tr>
<td>GL1 (mg/dL)</td>
<td>70-180</td>
</tr>
<tr>
<td>GL2 (mg/dL)</td>
<td>70-155</td>
</tr>
<tr>
<td>GL3 (mg/dL)</td>
<td>70-140</td>
</tr>
</tbody>
</table>

10.0 Procedural Notes

10.1 If glucose tolerance is requested for longer than 3 hours the pathologist on “Clinicals” should be consulted. If approved by the pathologist GLU should be ordered with the additional collection time entered in the comment section (i.e. 4 Hour)

11.0 Related Documents

11.1 PH1.006 Drawing of Outpatients
11.2 PH1.005 Collection Process

12.0 References

12.1 Diagnosis and Classification of Diabetes Mellitus, American Diabetes Association, Diabetes Care, Volume 31, Supplement 1, January 2008.

Authors:
GLUCOSE TOLERANCE LEVELS FOR PEDIATRICS

PRINCIPLE:
The glucose tolerance level for pediatric patients is performed the same as adults. Due to the weight and size of pediatrics, however, they can not be given the same amount of glucoa solution as an adult. Below is a formula to use to calculate the glucoa solution. Recommended dosage is 2 grams of glucose per kg of body weight.

1. Find the weight of the child in pounds. (lbs).

2. Convert lbs to kgs.

   2.2lbs=1kg

   Ex. If you have 35lb. Child,
   35lbs - 2.2lb = 15.9kg

3. Recommended dosage is 2 grams of glucose per kg

   Take your body weight in kg and multiply by 2 grams kg x 2 grams glucose

   Ex. 15.9 kg body weight x 2 grams glucose = 32 grams glucose.

4. Convert grams of glucose to ounces.

   Glucose in grams divided by 10

   Ex. 32 grams divided by 10=3.2 ounces

5. Give glucose solution to patient chilled on ice with a straw and ask that they ingest the solution within 5 minutes.
CCH2.401.09 GESTATIONAL DIABETES SCREEN (GDS)

1.0 Purpose
1.1 Screening for Gestational Diabetes Mellitus is performed by glucose measurement in plasma 1 hour after a 50 g oral glucose load administered without regard to the time of day or last meal.
1.2 Screening should be performed between 24 and 28 weeks of gestation on all pregnant women ≥25 year of age (or <25 years of age with one risk factor).
1.3 A positive result should be confirmed with a 3 hour glucose tolerance test performed on a subsequent day.
1.4 Gestational diabetes is associated with an increased incidence of congenital malformations and complications of pregnancy.

2.0 Definitions
2.1 Gestational Diabetes Mellitus: glucose intolerance with onset or first recognition during pregnancy. Diabetic women who become pregnant are not included in this category.

3.0 Specimen
3.1 Lithium Heparin Plasma
3.2 Order Code: GDS
3.2.1 Test code: 1GLU

4.0 Patient Instructions
4.1 Patient is not to eat during test.
4.2 Patient should avoid physical exertion, emotional stress, and stimulants (tobacco, alcohol, coffee, tea) during testing.

5.0 Required Equipment
5.1 Glucola, 50g bottle
5.2 Venipuncture equipment.

6.0 Procedure
6.1 Identify patient following procedure PH1.006
6.2 Give patient 50 G of Glucola to drink.
6.3 Timing starts with the first swallow and the patient should drink the full amount within 5 minutes of starting to drink.
6.4 Write proper collection time for 1 hour specimen on label.
6.5 Draw the 1 hr glucose 1 hour after the first swallow of glucola.
6.6 Label specimen following policy PH1.005
6.7 Glucose levels decrease rapidly in whole blood.
   6.7.1 Samples should be delivered promptly to Specimen Processing
   6.7.2 Samples should be centrifuged promptly to avoid decreasing glucose levels
6.8 Sample once received can be placed directly onto the track system
6.9 Centralink order will appear as: 1GLU

7.0 Safety
7.1 If during testing patient suffers nausea, fainting, sweating or other symptoms, the pathologist on “Clinicals” should be notified immediately.
7.2 Test will be discontinued after the ordering physician is consulted.
7.3 The patient should be given something to eat or drink before leaving the lab.

8.0 Reference Range
8.1 The reference range is a built as a calculation in Sunquest with
8.1.1 GDM1: which translates to >/=140 identifies approximately 80% women with GDM
8.1.2 GDM2: which translates to >/=130 identifies approximately 90% women with GDM
8.2 Comment to append to all results
8.2.1 GDSC: GDSC1|GDSC2|GDSC3
8.2.2 The Gestational Diabetes screen in pregnancy involves a 50 g glucose load and glucose measurement at 1 hour postload.
Abnormal values indicate the need to perform a diagnostic 3 hour Gestational Glucose Tolerance.

9.0 Panic Value
9.1 Less Than or Equal to 40 mg/dL
9.2 Greater Than or Equal to 501 mg/dL

10.0 Related Documents
10.1 PH1.005 Collection Process
10.2 PH1.006 Drawing of Outpatients

11.0 References
11.1 Diagnosis and Classification of Diabetes Mellitus, American Diabetes Association, Diabetes Care, Volume 31, Supplement 1, January 2008.

Original Prior to 1985
Revised by Christy Knight BS MT (ASCP)SC
September 17, 2009

NOTE: DO NOT COLLECT A FASTING SAMPLE NOR A URINE SAMPLE
Q1.031.05 RELABELING of CRUCIAL SPECIMENS

1.0 Policy Statement

The standard policy of Palmetto Health Richland Laboratory is to not relabel specimens, but to obtain new specimens whenever possible. This policy does not apply to Blood Bank, Histology, or Cytology Specimens. These departments have their own specific policies.

2.0 Guidelines

2.1 Mislabeled Specimens

2.1.1 Specimens will be considered mislabeled if the identification (label) on the container or tube is not accurate for the actual identity of the patient from which the specimen was obtained in a face to face encounter with patient.

2.1.2 Specimens sent to the lab with 2 different patient identification on container will be considered mislabeled

2.1.4 Laboratory will not return any specimens to units

2.2 Unlabeled Specimens

2.2.1 Specimens that are sent to the lab without any patient identification are considered unlabeled

2.2.2 Laboratory will not return any specimens to units

2.3 Replaceable Specimens

2.3.1 The collecting area or unit must recollect the specimen if there is a mistake or omission regarding the name or unit record number.

2.4 Irreplaceable Specimens

2.4.2 The attending physician can authorize specimens relabeling if he/she determined that the specimen can not be recollected.

2.4.3 Documentation of relabeling is required.

2.4.3.1 The floor must sign either a Mislabeled Specimen Worksheet form or complete a PHR Lab Occurrence Form Q1.017.XX.F3

2.4.4 Results for these relabeled specimens must have a comment attached that the physician authorized relabeling.

Example: glucose value X; Dr. X authorized relabeling at 1500 to tech number X.

2.4.5 Examples of irreplaceable specimens may include, but are not limited to:

2.4.5.1 Fluids

2.4.5.2 Jugular venipuncture

2.4.5.3 Infant collections

2.4.5.4 CSF

3.0 Author:

Karen W Sullivan MT (ASCP)

4.0 Initial Date of Policy

8/24/1992
Revised 4/13/2001
Revised 2/17/2010
Revised 3/1/2011
Revised 4/29/2011
Blood Bank Procedures

Effective Date: 03/10/2013

B8.018.02 LABELING SPECIMENS FOR CROSSTAMP/TYPE AND SCREEN

1.0 Purpose
Proper identification of patient, patient’s sample and blood products is crucial to safe transfusion. A correctly labeled specimen is the first step in transfusion safety. Verification of all patient information prior to transfusion is the final crucial step in transfusion safety.

2.0 Safety Precautions
2.1 Refer to PH 1.005.09 Collection Process for requirements applicable to collection of samples for testing.

3.0 Equipment
3.1 Computer order labels or patient ID labels (chart labels)
3.2 Blood Bank armbands, if applicable

4.0 Sample Requirements
4.1 Pink-stoppered tubes (K$_2$ EDTA) are preferred.
4.2 Samples used for compatibility testing must be collected within 3 days of transfusion. The day of collection is Day 0.
4.3 Refer to B8.013 BLOOD BANK SPECIMENS for information on specimens for other Blood Bank tests.
4.4 The patient’s hospital bracelet and the computer order label must match exactly for patient name, medical record number and date of birth.
   4.4.1 Specimens drawn by an outside source may use a unique identification system other than a Palmetto Health Richland medical record number.
   4.4.2 Specific requirements for outside samples are described in SOPs specific for those facilities.
   4.4.3 For outside samples, Palmetto Health Richland Laboratory staff will enter patient information into the computer system and document the assigned medical record number.
4.5 Allowable corrections to items listed in 4.4 are;
   • Date of collection
   • Time of collection
   • Legibility of laboratory phlebotomist identification
   4.5.1 Corrections are NOT allowed for any discrepancy in patient name, medical record number or date of birth.
   4.5.2 Discrepancies in name, medical record number or date of birth require recollection of sample.

5.0 Specimen Collection
5.1 Ask patient to verify name and date of birth, if able
5.2 Compare order label to hospital armband on the patient.
   5.2.1 Verify patient name, medical record number and date of birth.
   5.2.2 Patient must have an identification bracelet on before drawing blood.
   5.2.3 Any discrepancy (ies), must be resolved before obtaining the
sample.

5.3 Blood Bank identification bracelets are available for certain patient care situations.

5.3.1 For emergencies or if a discrepancy cannot be resolved in a reasonable amount of time, a Blood Bank armband may be placed on the patient and must be used to establish a positive identification link between patients and red blood cell products for transfusion.

5.3.2 All emergency patients with no known identification will be registered as “Trauma Male (Female)”, “STEMI”, or “John (Jane) Doe”. The Blood Bank bracelet will remain on the patient until actual patient identification has been determined.

5.3.3 After patient identification has been determined and new identification bracelet placed on patient, a Blood Bank armband is not required for testing of subsequent samples if a transfusion is needed. Should patient identification be unavailable, the original Blood Bank bracelet will remain on the patient for the current hospital stay.

5.3.3 Blood Bank armbands will be used in the following situations.

5.3.3.1 Emergency Dept. (Trauma, Stemi, John or Jane Doe)

5.3.3.2 Outpatient and Offsite Transfusions

- Sickle Cell/Infusion
- Pediatric Oncology
- Health South
- Dept. of Corrections (KCI)
- Columbia Care Center (CCC)

5.3.4 Collect specimen according to PH 1.005.09 Collection Process.

5.3.5 Label all tubes at the patient’s bedside. If all information on patient’s order label matches exactly, place on tube and label with date, time, and phlebotomists ID number and initials. For samples drawn by non-laboratory personnel, PRINT date, collection time, FIRST and LAST NAME (person collecting the specimen) on specimen label. Name must be legible.

5.3.6 Before leaving the patient, the information on the labeled samples must be verified. Refer to Palmetto Health “Final Check” procedure.

5.4 To eliminate the need for a second sample draw for non-group O patients who do not have a historical blood type on file in the Blood Bank, samples collected by OR staff, OR holding, and Labor & Delivery must be labeled using the following process.

5.4.1 When a Type and Screen/Type and Crossmatch is ordered for a patient in the OR and Labor & Delivery, the entire process must be witnessed by two licensed staff (RN, Preop RNs, Holding Room, OR RNs, CRNAs, Anesthesiologist), one of which is obtaining the blood sample. Obtain blood sample with the witness present in the patient’s room for the entire process.

5.4.2 A chart label/patient ID label will be placed on the tube after verification of patient information on the patient’s armband.

5.4.3 The label will include the date and time drawn and the first and last name (no initials) of TWO patient care staff members; the person who draws the sample and a witness to the draw. The names must be legible. Example: Amanda Moore, CRNA and Shari Altman, RN.

5.4.4 Both patient care staff members must verify patient name, medical record number, and date of birth. Have patient verbalize patient name and date of birth (when possible) as the staff are verifying information
with the patient ID bracelet and chart label/patient ID label. Any discrepancies must be resolved before moving forward. **There will be ZERO TOLERANCE on any discrepancy in patient name, medical record number, or date of birth.** All tubes must be labeled at the patient’s bedside.

5.4.4.1 Place the labeled sample tube in a small transport bag and transport to the Blood Bank.

5.4.4.2 If the specimen does not have two legible patient care staff member’s signature on the label, the tubes will not be accepted. ** NO EXCEPTIONS!** The sample must be recollected.

5.5 A second sample may need to be drawn for ABO verification if there is no previous history on the patient and the patient is non-group O. Refer to section 5.4 for exceptions.

5.5.1 Blood Bank staff will notify floor when second sample is needed.

5.5.2 Blood Bank will order ABO verification (ABO/Rh type).

5.5.3 Blood Bank will send order label and tube to the floor in a small biohazard bag.

5.5.4 Sample shall be drawn and labeled as outlined in sections 5.1-5.3.6.

5.5.4.1 Place the labeled sample tube in the small biohazard bag and send directly to the Blood Bank.

5.6 Blood Bank staff will verify that patient information matches and that all other information (date, time, collector, etc.) is on the sample prior to performing compatibility testing.

5.7 When applicable, Blood Bank staff will:

5.7.1 Enter the Blood Bank ID Number (on barcode blood band) as the result for Sunquest test code %RN (Armband Number) in the applicable battery when testing is performed.

5.7.2 Verify the Blood Bank ID Number in the identification checks for each RBC product prior to issue. Refer to B2.027.12 Blood Product Issue.

5.8 Transfusionists must verify the Blood Bank ID number in the identification checks performed immediately prior to transfusion of each RBC product.

### 6.0 Related Documents

6.1 PH 1.005.09 Collection Process
6.2 B8.013 Blood Bank Specimens
6.3 B8.015 Repeat Blood Type for Patient Record
6.4 B2.027.12 Blood Product Issue
6.5 Palmetto Health “Final Check” procedure

### 7.0 References

7.1 Standards for Blood Banks and Transfusion Services, current edition, AABB

Author: Dawn J. Brown 01-14-03
Revised by: Dawn J. Brown 03-15-06
Revised by: Susan Cockfield 07-12-2010
Revised by: Valesia W Burgess, MA, MT (ASCP) BB 11-28-2012
Revised by: Valesia W Burgess, MA, MT (ASCP) BB 01-10-2013
1. Obtain pre-printed patient label per your protocol.
2. Verifyaggeration identity.
3. Place a patient label into the "PLACE PATIENT IDENTIFICATION HERE" area of the band.
4. Peel back from the shield.
5. Seal the edge down on a flat surface using your fingers.

6. Label any items at patient bedside as required per your protocol.
7. Remove any stickers from band at the perforations.
8. Attach all stickers to specimen tube (if desired).
9. Scan blood bank ID (BBID) into Laboratory Information Systems, or enter manually.
10. Remove extra stickers with scissors if not required per your protocol.
PROTOCOL FOR USE AND TRANSFUSION OF BLOOD PRODUCTS

COMPONENT REQUESTS

The component must first be ordered by the physician and carefully ordered by the unit secretary or designee to the computer system by proper computer codes.

When autologous or directed-donor units are needed, they must be ordered as such. Do not order packed cells and expect the Blood Bank to know that the patient has autologous or directed-donor units. These units may not be in inventory yet.

NOTE: This would be a good time to ask the patient if they have autologous or directed-donor blood they are expecting to be used for them.

Patient diagnosis is often vitally important to the Blood Bank staff in securing the proper product for the patient. The prime example is when blood is ordered for people with sickle cell disease. These units must be screened for sickle cell trait. Blood Bank must be notified since this screening is not routine and since Sickle Cell is not usually listed as the diagnosis in HBO.

NOTE: All units to be used for babies are routinely screened for sickle cell.

BLOOD COMPONENTS

PACKED RED BLOOD CELLS
1. A routine crossmatch must be performed, blood will be held for 3 days.
2. Each unit of packed red cells contains approximately 250-300 ml.
3. This product is prepared as leukoreduced from the Blood Supplier – The American Red Cross.

WHOLE BLOOD
1. Whole blood is only available as an autologous unit.
2. Whole blood must be crossmatched.

WASHED RED CELLS
1. Washed red blood cells must be ordered 24 hours advance.
2. Washed cells must be crossmatched.
3. Once washed the red cells have a 24 hour expiration period.
4. Each unit contains approximately 250ml.

AUTOLOGOUS/DIRECTED DONATED BLOOD
1. Autologous blood is the patient’s own blood withdrawn before surgery in order to provide blood during the procedure.
2. Arrangements must be made in advance with the Columbia American Red Cross to schedule blood collections. Special Donation Department - Tel. #251-6078. NOTE: The American Red Cross will notify the PHR Blood Bank of scheduled donations, listing the amount and type units ordered.
3. Neither Directed Donations or Autologous Blood is available in emergency situations. Processing takes 3-5 days from collection for directed-donor and autologous units to be
available to PHR. All blood must be fully tested and this process takes approximately three working days from collection.

4. Directed donation units must be crossmatched, and will be held for 3 days. Autologous units must be crossmatched, and will be held until the patient is discharged.

PLASMA
1. Plasma is not crossmatched but an ABO/RH blood type from the patient’s current admission is necessary to give type-compatible plasma.
2. Fresh Frozen Plasma (FFP; frozen within 8 hours of collection) and Plasma, Frozen Within 24 Hours of Collection (FP24) are used interchangeably for most patients.
3. Neonates (babies up to 4 months old) are transfused with fresh FFP only (thawed \( \leq 24 \) hours).
4. Fresh plasma (thawed \( \leq 24 \) hours) is available for patients with known isolated coagulation factor deficiencies. Include the comment “Fresh plasma only” with requests for these patients.
5. Plasma is stored frozen and thawed plasma is not routinely available. Notify the Blood Bank one hour prior to transfusion to allow time to thaw plasma products.

CRYOPRECIPITATE
1. Cryoprecipitate is not crossmatched, but a current ABO/RH type from the patient’s current admission is necessary. ABO compatible is given when possible.
2. Each unit contains approximately 15 ml.
3. Allow at least 20 minutes notice to thaw cryoprecipitate. Notify Blood Bank when to thaw the cryoprecipitate.
4. Once thawed, it must be transfused within 4-6 hours.

PLATELETS
1. Platelets are not crossmatched, but a current ABO/RH type from the patient’s current admission is necessary. They are given ABO compatible, when possible.
2. Platelets must be ordered 24-48 hours before transfusion to insure that they will be available.
3. All platelets are ordered on an as needed basis from the American Red Cross.
4. Platelets have an expiration period of 5 days, the time held for each patient depends on the time remaining before expiration of product.

PLATELETS PHERESIS
1. Platelet pheresis is a platelet product equivalent to 6-10 single platelet units drawn from one donor through the pheresis process.
2. Pheresis units are used to provide platelet support to patients while limiting the donors they are exposed to.
3. Pheresis units are not usually crossmatched unless they contain a large amount of contaminating red cells. They are given ABO compatible, when possible.
4. The Blood Bank keeps an inventory of Platelet Pheresis products in-house.
5. This product is prepared as leukoreduced from the Blood Suppliers – The American Red Cross and The Blood Connection.

LEUKOCYTE PHERESIS (Granulocyte Pheresis)
1. Leukocyte pheresis with or without platelets are a special product obtained by the pheresis process from a single donor to provide white blood cells for patients.
2. Leukocyte pheresis units must be crossmatched because they contain a large amount of red
blood cells.
3. These products are a special order from the American Red Cross, and are usually released before complete donor testing.
4. Leukocytepheresis units must be infused within 24 hours of collection, preferable ASAP within 8 hours.

VOLUME REDUCING PLATELETS
1. Floor needs to call Blood Bank when patient needs a platelet product volume reduced.
2. Product will be ready in 2 hours.
3. Product will expire in 12 hours or the original expiration date, whichever is first.

POOLED CRYOPRECIPITATE
1. SIM #: 15442. Only one order needed.
2. Please call Blood Bank when ordering cryoprecipitate.
3. Only cryoprecipitate orders of 4 or greater will be pooled
4. After cryoprecipitate is pooled, it expires in 4 hours.

POOLED PLATELETS
1. SIM #: 15441
2. Please call Blood Bank when ordering pooled platelets.
3. Only platelet orders for 4 or more units will be pooled
4. After platelets pooled, expiration time is 4 hours.

IRRADIATED BLOOD PRODUCTS
A. These must be requested when blood or blood component is ordered.
B. Indication for use:
   i. Irradiation of blood components (except fresh frozen plasma and cryoprecipitate) prior to transfusion is an attempt to prevent Graft vs. Host Disease in immunosuppressed patients and first degree donors.
C. Where products are irradiated:
   i. This procedure is done in the Blood Bank Dept.
D. Procedure:
   i. When irradiation of a product is requested, Blood Bank will irradiate with 25 GY (2500cGY).
E. Labeling:
   i. All irradiated products will be labeled “Irradiated” and the date, time and tech initials.

EMERGENCY RELEASE OF BLOOD FROM BLOOD BANK

When there is a desperate need for blood, the patient’s physician may opt to transfuse uncrossmatched blood. For these times, notify the Blood Bank with the information for the emergency need of products before arriving in the Blood Bank. The Blood Bank will initiate the Emergency Release Form (See Appendix).

It is important that the floor (unit) send a sample of the patient’s blood to the Blood Bank as soon as possible so that a crossmatch can take place or type-specific blood can be given. PHR Blood Bank policy for product selection in emergency situations with patients of unknown ABO/RH:
- O Rh positive PRBC’s for males
- O Rh negative PRBC’s for females
Upon transfusion of uncrossmatched blood, return the physician signed Emergency Release Form back to Blood Bank. This completed form represents the transfusion record of that product. (Blood Bank will forward the original to the patients’ chart).

NOTE: A representative from the ER, OR, or nursing unit is required to pick up the units from the Blood Bank. This individual will need a completed Product Request Form for the release of the blood products.

MASSIVE TRANSFUSION

Massive transfusion is defined as infusion, within 24 hours of a volume of blood approaching or exceeding replacement of recipient’s total blood volume. Exchange transfusion of an infant is also a massive transfusion. At this point, complete crossmatching has limited benefits, since only a small amount of the patient’s own red cells remain. It is only important to confirm ABO/RH compatibility of subsequently transfused blood.

PICKING UP BLOOD COMPONENTS FROM THE BLOOD BANK

1). IN PERSON
   Blood will be released to representatives of the nursing units who present a “Form for Picking Up Products from the Blood Bank”. This form is stamped with the patient’s addressograph and the product needed.
   **ONE CARRIER WILL BE ALLOWED TO PICKUP BLOOD PRODUCTS FOR ONE PATIENT AT A TIME. Refer to Appendix for form example.**

2). VIA PNEUMATIC TUBE SYSTEM:
   To provide blood products in a timely efficient manner without requiring nursing to leave unit.
   Blood will be released to the units upon receiving a properly filled out “Form for Picking Up Products in the Blood Bank: through the tube system. **Refer to Appendix for form example.**

Nursing Unit will phone Blood Bank that the form has been sent via tube system. Release Form will have:
   a. Name of patient
   b. Medical Record Number
   c. Requesting unit location and phone number
   d. Product requested, number required, special instructions (irradiate, etc.)
   e. Name of person that will accept product from tube system
   f. Signature of nurse administering the product

Blood Bank will:
   a. Get form from tube system
   b. Select appropriate units
   c. Compare information on units and form with another person using standard issue protocol with verbal callback
   d. Place product in sealed biohazard plastic bag (must not be sealed without removing most of
e. Call person designated on form to accept product and notify them to wait at tube station for product. Blood Bank will then go to tube station and complete section for released date, time and initials of issuing tech on the Release Form. Form will be tucked in outer flap of plastic bag. Product will be tubed immediately.

Person in nursing unit accepting product from tube system will:
   a. Check name and product/products
   b. Note on form number of products received. Multiple products will be sent one after the other.
   c. Note time last product received
   d. Note their name on Release Form
   e. Immediately send completed form back in tube system

Blood Bank tech will expect return of form within 15 minutes.

Failure to do this in a prompt manner may result in loss of tube privileges for that floor.

Blood Bank tech will note time form returned via tube system on log. Completed Release Form will be stored in Blood Bank.

NOTE: If a product is lost in tube system, contact Engineering Services immediately!! Notify Blood Bank of product status.

RETURN OF BLOOD PRODUCTS TO THE BLOOD BANK

If a blood product cannot be infused, for any reason, it must be returned to the Blood Bank within 30 minutes of the time it was issued. DO NOT store blood products in refrigerators on the nursing units. Blood products must be kept within strict temperature ranges in a monitored refrigerator for patient safety. Blood that has been warmed cannot be returned for re-issue.

IDENTIFICATION OF THE PATIENT BEFORE STARTING THE TRANSFUSION

Accurate identification of the donor’s blood and the intended recipient may be the single most important step in insuring transfusion safety. Most fatal hemolytic transfusion reactions occur because ABO-incompatible blood was inadvertently administered. Strict adherence to the following steps is required:

It is necessary for two people to verify the patient identification information at the patient’s bedside.

The following information should be checked:
   1. the patient’s full name
   2. the patient’s medical record number
   3. the Fenwal Typenex Armband number, if applicable
   4. the donor unit number
   5. the ABO/RH type listed
   6. the expiration date of the product
   7. color and appearance of blood bag

All these items must agree on the Blood Transfusion Record, the Compatibility Sticker, and the patient’s armband.
If there is a discrepancy, **DO NOT** transfuse the blood product. Return it immediately to the Blood Bank.

The transfusion of one red cell unit should be accomplished within 2–4 hours. If the units are not completely transfused within 4 hours, discontinue the transfusion. The blood units provide an excellent growth medium for bacteria and extending the transfusion time greater than 4 hours is not safe. If a longer transfusion time is necessary due to the patient’s condition, the blood unit may be divided by the Blood Bank personnel and the two halves transfused for up to four hours each.

**INFUSION OF BLOOD AND BLOOD COMPONENTS:**

Each transfusion area should have its own protocol for patient preparation, etc. for infusion in addition to these notes.

All blood and blood components must be given through an administration set with a filter. The choice of sets and filters is the responsibility of nursing service.

Nursing should also check:

a. vital signs
b. check the chart or with the Blood Bank for the need of warming coils
c. recheck orders to make sure the proper products are being given (i.e. Autologous, Directed-Donors. Autologous units are specially marked with green stickers, Directed –Donor units are specially marked with orange tag).
d. **CAREFULLY FOLLOW PATIENT IDENTIFICATION PROCEDURES ABOVE BEFORE STARTING TRANSFUSION**

**AFTER THE TRANSFUSION**

The Transfusion Record should be completed and one copy placed on the patient’s chart, and the second returned to the Blood Bank promptly.

**IMPORTANT:** The slip attached to the product must be returned to Blood Bank and is critical for maintaining an accurate history for the patient in case a look back is required if problems are discovered later with the product the patient received.

Empty blood product bags are to be disposed of on the nursing units according to established policy.

**TRANSFUSION REACTION INVESTIGATION**

It is the responsibility of the transfusionist to observe the patient for signs or symptoms of transfusion reactions. There are many different types of transfusion reactions possible;

1. Immediate reactions
a. Hemolytic symptoms include pain in the lumbar region of the back or along the arm where blood is being administered, rapid elevation of temperature and pulse, chills, flushing of skin, nausea, vomiting and occasional blood pressure drop. Blood in the urine and oozing from wounds may also be observed.
b. Febrile symptoms include rise in temperature (greater than 3 degrees F) chills.
c. Allergic reaction symptoms include rash, itching and flushing of the skin. These are
the only symptoms that transfusion may be continued (after the administration of antihistamines) with the physicians orders.

2. Delayed reactions: incompatible transfusions may manifest themselves after several days by the appearance of jaundice and increasing anemia with or without other clinical symptoms. If this is suspected contact the blood bank immediately.

If a transfusion reaction is suspected follow the directions on the back of the Transfusion Record attached to the product. See Appendix.

HOLDING BLOOD FOR PATIENTS

Physicians orders to “keep blood on hand at all times are the responsibility of the nursing units. The nurse taking care of the patient must enter orders as necessary to assure adequate blood is available.

STEPS TO DETERMINE IF BLOOD PRODUCTS ARE IN THE BLOOD BANK

1. Check the physician’s order.
2. Check the HBO computer using Order Inquiry.
   The laboratory results displayed will list:
   a. The Blood component type
   b. The units ordered
   c. The armband number
   d. The patient’s ABO/RH (D)
   e. The units allocated (available for transfusion)
   f. The units issued

Blood crossmatched will be held for 3 days, expired crossmatches are released at 6AM on the third day.
Do not call the Blood Bank to see if your patient has blood available, the information is in the HBO system.

The medical reasons for every transfusion must be carefully evaluated and should be monitored for therapeutic effectiveness.

CIRCULAR OF INFORMATION (American Red Cross)

The current circular of information from the ARC on the use of human blood and blood components is posted on the PHANET (MyPal/myCampus/Richland/Laboratory Services/Laboratory Manual). This circular is to be available for the physicians and transfusionist. The circular is prepared by the American Red Cross and the American Association of Blood Banks. It has the approval of the Center of Biologics Evaluation and Research, Food and Drug Administration, and is consistent with the use of uniform labeling.

A list of Blood Components and the indications for transfusion are also in the packet. This list describes the component, the composition of each component, the approximate volume, and the indication for transfusion in an abbreviated form. Please see appendix for the list.
Q1.026.11 POINT OF CARE TESTING

1.0 Policy Statement  To assure the quality of patient results on any laboratory test; to comply with regulatory standards, including CLIA, JCAHO, OSHA; and to maintain CAP accreditation standards, PHR Laboratory will monitor all units performing point of care testing. Authorization of personnel and standards for compliance, performance, quality assurance, quality control, safety and action taken for non-compliance is the responsibility of the Professional Director of Laboratory Services holding the CLIA license. The POC program performs only tests that are FDA approved/cleared, and follows manufacturer instructions without modification.

2. Guidelines

2.1 All personnel performing waived testing must have documented training and meet acceptable competency standards prior to testing. All personnel performing moderate level point of care testing must have earned a high school diploma or equivalent as a minimum, documented training provided by the laboratory, and meet acceptable competency standards, before performing patient testing. Waived competency may include, and moderate level competency will include:

2.1.1 Direct observations of routine patient test performance, including, as applicable,
   2.1.1.1 patient identification and preparation
   2.1.1.2 specimen collection, handling, processing
   2.1.1.3 testing performance

2.1.2 Monitoring the recording and reporting of test results, including, as applicable, reporting critical results

2.1.3 Review of
   2.1.3.1 intermediate test results or worksheets
   2.1.3.2 quality control records
   2.1.3.3 proficiency testing results
   2.1.3.4 preventive maintenance records

2.1.4 Direct observation of performance of instrument maintenance and function checks, as applicable

2.1.5 Assessment of test performance through
   2.1.5.1 testing previously analyzed specimens
   2.1.5.2 internal blind testing samples
   2.1.5.3 or external proficiency testing samples

2.1.6 Evaluation of problem-solving skills

2.1.7 Competency must be reassessed at least annually.

2.1.8 During the first year that an individual is performing such patient testing, competency must be assessed every six months.

2.2 Quality control is an essential component of all laboratory testing. The following criteria are required

2.2.1 Quality Control (QC two levels) must be performed and evaluated by the user to be within acceptable limits before patient testing is done. This may be electronic, internal or external.

2.2.2 QC is run the same as patient testing
2.2.3 All users must periodically perform QC
  2.2.3.1 Initial users must perform QC twice in the first year
  2.2.3.2 Current users must perform QC at least annually
  2.2.3.3 Glucometer users must have performed QC within 6 months of their certification date

2.2.4 QC will be reviewed on a periodic basis, by designated laboratory and testing staff.
  2.2.4.1 Trends for QC, means, SD’s and CV’s are addressed.

2.2.5 QC will be accessed daily by the staff performing and monthly by POCT supervisor.

2.2.6 New lots of QC for the glucometer are evaluated and ranges set or confirmed when placed into use

2.2.7 Urine QC is verified by the Urinalysis department, and aliquots are sent to the units.

2.2.8 ACT’s by ITC Hemachrons have adjusted QC ranges, based on historical data.

2.2.9 QC standard (for units reporting) is based on the number of QC performed divided by the number of QC required.
  2.2.9.1 This should be 100%, 98% acceptable rarely
  2.2.9.2 Below standard % will require action from the testing unit and acceptable performance.

2.2.10 Units with repetitive and or unresolved problems may loose the POCT programs.

2.2.11 QC statistics will be reviewed and monthly data assessed for significant changes
  2.2.11.1 Troubleshooting will be done as indicated.

2.2.12 i-STAT QC is run
  2.2.12.1 Automatically with internal simulators every 8 hrs
  2.2.12.2 External simulator at least every 6 month or when indicated
  2.2.12.3 LQC is run with new lot#, new shipments, and monthly at a minimum

2.3 Point of Care Testing will follow the same standards as the laboratory for proper:
  2.3.1 Orders, physician written or verbal orders, or standing orders in defined cases
  2.3.2 Patient identification
  2.3.3 Accurate collection procedures
  2.3.4 Complete specimen identification and labeling
    2.3.4.1 including the date and time of collections
    2.3.4.2 identification of the person collecting sample and/or testing when applicable
  2.3.5 Laboratory procedures are available on the units, and followed for each test performed.
    2.3.5.1 Procedures follow manufacturer’s instructions
  2.3.6 Complete recording and documentation of patient results in the designated place, to include
    2.3.6.1 initials of performing personnel
    2.3.6.2 documentation of results in the patient permanent record.
      2.3.6.2.1 Laboratory LIS, CUM, EMR
      2.3.6.2.2 Patient care system EMR
      2.3.6.2.3 Flow sheet for unit
      2.3.6.2.4 ED flow / face sheet
2.3.6.2.5 Case procedure, as in Perfusion or ECMO

2.3.7 Documented review of results by testing personnel and or physicians (this can be done at the time of testing or reporting)

2.3.8 Completed loop involvement with the laboratory and confirmatory testing, when applicable.

2.4 Testing personnel and attending physicians are responsible for the daily review and assessment of patient results.

2.4.1 Any problems are to be confirmed, and referred to the laboratory for consultation.

2.4.2 This review will cover the

2.4.2.1 technical
2.4.2.2 analytical
2.4.2.3 improbability of unusual or unexpected patient results.

2.5 Panic and or Critical patient results must be documented with proper notification of physician, codes in instruments

2.6 Procedures define AMR and / or reportable limits per each analyte.

2.6.1 This would include the linear range definitions for the testing.

2.7 Normal and expected ranges will be reported with each patient test result in

2.7.1 the LIS, with patient results
2.7.2 posted on the units if applicable
2.7.3 available in the Laboratory Manual on the units
2.7.4 or on charting forms.

2.8 The laboratory will be responsible for performing

2.8.1 linearity checks
2.8.2 calibrations and calibration verifications
2.8.3 instrument method verifications according to manufacturer guidelines.
2.8.4 Software upgrades according to manufacturer

2.9 Assayed QC will have established target ranges.

2.10 Testing personnel will be competent to perform testing

2.10.1 Users of non-waived testing must provide the laboratory certification of education; diplomas or current Ns license
2.10.2 Each user will have documented initial training. The lab POC Coordinator or designee performs the training, or training from nursing educators (Ns Orientation staff), or unit based training.
2.10.3 Competency checks at 6 months and annual reviews thereafter
2.10.4 Reviews may be done as often as quarterly, depending on performance
2.10.5 Evaluation may be from

2.10.5.1 written tests
2.10.5.2 QC performance
2.10.5.3 Proficiency Testing performance
2.10.5.4 unknown samples
2.10.5.5 observation and demonstration of judgment
2.10.5.6 All users must have knowledge of the procedures
2.10.5.7 Staff are evaluated for color blind testing through HealthWorks

2.11 External Proficiency Testing will be performed in all applicable areas.

2.11.1 Unknown samples may used to verify competency checks
2.11.2 The laboratory is enrolled in available CAP surveys when available for the testing performed
2.11.3 The laboratory policy for PT is enforced for POCT areas.

2.12 Changes in lot # of reagents or tubes / kits will be confirmed with proper
QC documentation before being placed into use.

2.12.1 All reagents and supplies must be
    2.12.1.1 dated with the new expiration date marked
    2.12.1.2 stored properly
    2.12.1.3 used by expiration date.

2.13 POCT will be monitored by the laboratory through the Quality Assurance Coordinator

2.14 Personnel shall be assessed for color blindness as pertinent to the POCT testing, the unit is responsible for providing documentation records

2.15 Safety procedures and Universal / Standard Precautions are required when POCT is performed.
    2.15.1 Disinfection of POC instruments is required to prevent transmission of infections
    2.15.2 Use of retractable/safety lancets for blood collections
    2.15.3 Any concerns with operator or patient safety should be immediately reported
        2.15.3.1 to the laboratory
        2.15.3.2 hospital administration
        2.15.3.3 CAP
        2.15.3.4 JCAHO respectively if issues are not resolved.

2.16 The extent to which the POCT is used to treat patients is authorized by the Professional Director of Laboratory Services and approved by the Patient Care Committee

2.17 Use of test results are defined as screening purpose only or for monitoring patient status, unless designated as follows:
    2.17.1 Activated Clotting Times - ACT
        2.17.1.1 Reportable limits are 80 to 750 sec for Response
        2.17.1.2 Reportable limits are 0 to 400 sec for ITC Elites
        2.17.1.3 Perfusion Surgical perfusion use
            Bull Std >480 sec
        2.17.1.4 Cath Lab per physician, per procedure
            ≤ 200 sheath / stint pull
        2.17.1.5 CCU ≤ 200 sheath / stint pull
        2.17.1.6 ECMO regulation of ECMO heparin
            180-200 sec
        2.17.1.7 Special Procedures per physician, per procedure

2.17.2 Urine Specific Gravity – SG
    2.17.3.1 CBD chemo therapy, critical care
        Screening results, sent to lab for confirmatory testing if needed

2.17.4 Urine Dipstick
    2.17.4.1 CBD
        Screening results, sent to lab for confirmatory testing if needed

2.17.3 Glucose Screens
    2.17.4.1 Reportable ranges
        2.17.4.1.1 45 to 400 mg/dL for adults
        2.17.4.1.2 45 to 200 for Nurseries.
    2.17.4.2 Values above or below reportable limits may have lab confirmatory testing if physician requested
    2.17.4.3 IP screening/monitoring only, no diagnostic testing. Hyper and Hypo glycemic protocols
2.17.4.4 Clinics same as IP
2.17.4.5 HBO follow protocol with OJ treatment, call physician
2.17.4.6 Perfusion physician directed
2.17.4.7 Cardiac Rehab
2.17.4.8 Pediatric, NICU, and CCU Transport

2.17.5 Hemoccult
2.17.5.1 Screen test – ER physicians

2.17.6 KOH, Wet Preps, and Fern
2.17.6.1 OB/GYN
2.17.6.1.1 Medical staff credentialing

2.17.7 i-STAT usage
2.17.7.1 ER – Troponin (chest pain patients)
2.17.7.2 CVOR – CG8+, ACTk
2.17.7.3 Radiology – Creatinine (contrast procedures)

2.18 Dr. Paul Guerry, Professional Director of PHR Laboratory is ultimately responsible for the compliance to regulatory requirements, and the quality of any laboratory testing performed at Palmetto Health Richland. The POC program performs only tests that are FDA approved/cleared, and follows manufacturer instructions without modification.

2.19 Any problems or questions should be referred to the Quality Assurance / POCT Coordinator of the Laboratory or the POC Techs

4. Related Documents
4.1. Q1.009 Competency
4.2. Q1.016 Proficiency Testing
5.3 Q1.027 POCT for Physicians

5. References

5.0 Author: Karen W Sullivan MT (ASCP)

6.0 Initial Date of Policy 3/20/95
Revised 7/12/2004
Revised 5/17/2005
Revised 5/14/2007
Revised 2/2/2009
Revised 5/15/2009
Revised 2/11/2010
Revised 7/14/2010
Revised 8/6/2010
PC1.014.06 PXP GLUCOMETER / Xceed Pro Glucometer Strips

1.0 Principle
1.1 The Precision PXP / Xceed Pro Blood Glucose Testing System is a portable in vitro diagnostic system that can provide health care professionals blood glucose test results used as an aid in monitoring the effectiveness of diabetes control programs, and not for diagnosis diabetes mellitus.
1.2 When blood sample is applied to the test strip, the glucose in the blood reacts with chemicals on the test strip, producing a small electrical current. The size of the current is measured and then a result is displayed by the monitor.

2.0 Safety Precautions
2.1 Always wear gloves, proper PPE, and follow safety and biohazard policies when performing testing with blood.
2.4 Use the PXP glucometer properly
2.4.1 Do not allow blood or other solutions to run down the test strip and into the glucometer.
2.4.2 Do not use the PXP glucometer without the port protector
2.4.3 Operate the Precision PXP system within the temperature and humidity ranges, see Equipment
2.4.4 Check PXP glucometer for damage or blood before using. Clean daily and between patients with approved cleaners, see Maintenance for specific cleaning instructions
2.4.5 Use scanner properly with laser precautions
2.4.5.1 Hold barcode 3-12 inches from scanner, and at a 50-130 degree angle to scan.
2.4.5.2 Never look into the scanner laser or point it toward anyone’s eyes.
2.4.5.3 If you hold the scanner for three seconds, the scanner stops. Reposition the scanner and try again.
2.4.6.4 Audible beep will occur when successfully scanned
2.4.6 Dispose of lancets or needles in approved sharps containers.
2.4.7 Dispose of wastes and strips in Biohazardous containers.

3.0 Equipment
3.1 Precision PXP Glucometer system, 2 versions of meters in use (SN starting with XP or SN starting with KC)
3.1.1 XP meters 7.7 x 2.96 x 2.1 inches
3.1.1 KC meters 7.85 x 2.93 x 1.92 inches
3.1.2 XP meters 9 ounces / 256 grams
3.1.2 KC meters 10.58 ounces / 300 grams
3.1.3 AA Alkaline batteries
3.1.4 Battery life typically 2.8 Amp Hour
3.1.5 Meter storage Temp -4 to 122 F
3.1.6 Operating Temp - 59 to 104 F (15 to 40 C)
3.1.7 Humidity 10 – 90%
3.1.8 Altitude up to 7,200 feet
3.1.9 Memory
3.1.9.1 2500 pt tests
3.1.9.2 1000 QC
3.1.9.3 Operators 6,000
3.1.9.4 20 PT
3.1.9.5 20 Linearity
3.1.9.6 Pt ID# 6,000
3.1.9.7 Strip lots – 36 lot#
3.1.10 Abbott Docking Station
3.1.11 Lancets or phlebotomy supplies

4.0 Required Reagents
4.1 Xceed Pro Glucometer test strips
   4.1.1 Glucose dehydrogenase (Microbial) \( \geq 0.03 \) U
   4.1.2 NAD+ (as sodium salt) \( \geq 1.0 \) ug
   4.1.3 Phenanthroline quinine \( \geq 0.02 \) ug
   4.1.4 Non-reactive ingredients \( \geq 16.3 \) ug
4.2 Precision or Medisense Quality Controls
   4.2.1 Low & High Ranges
      4.2.1.1 Store 39 to 86 F room temp
      4.2.1.2 do not freeze
      4.2.1.3 Date bottle with new expiration date when opening
      4.2.1.3.1 vials are good for 90 days after opening
      4.2.1.4 NEW EXPIRATION DATE MUST BE ON THE
      VIALS once opened.
4.3 Precision PXP Xceed Pro strips are individually wrapped and sealed in foil packets, use properly.
   4.3.1 Store at room temperatures between 39 and 86 F and out of direct sunlight.
   4.3.2 Do not freeze or refrigerate!
   4.3.3 Strips are stable until expiration date printed on the packet (in barcode information) when stored as recommended.
      4.3.3.1 The Precision PXP system will not accept strips that are beyond their expiration date.
      4.3.3.2 After opening the strip, use immediately.
   4.3.4 Do not handle strips with wet or dirty hands.
4.4 Do not use strips that are
   4.4.1 WET,
4.4.2 BENT,
4.4.3 SCRATCHED or PUNCTURED package,
4.4.4 IMPROPERLY STORED,
4.4.5 or in any way DAMAGED.

4.5 Use each strip only once. Do not reuse strips. Do not cut strips in half or alter in any way.
4.6 Use only the strip that you scan, do not scan one strip and use another strip.
4.7 Do not touch the strip after application of blood
4.8 Use only Xceed Pro strips in the PXP glucometer.

5.0 Performance Specifications and Method Limitations:
5.1 Meter and strips must be at room temperature.
5.1.1 If meter is moved from one temperature extreme to another, please allow time to reach new temperature before using
5.1.2 Operate the Precision PXP system within the temperature and humidity ranges.
5.2 Use only QC solutions specified on insert to control the glucometer.
5.3 Use only Xceed Pro glucometer strips on the PXP glucometer with proper storage and reagent use requirements
5.4 Apply blood to the target area from either the top or side, following proper collection procedures
5.5 Do not allow blood or other solutions to run down the test strip and into the glucometer.
5.7 PXP will automatically turn off if left unattended for 4 minutes.
5.8 Check date and time accuracy each time glucometer is used
5.9 Check the units of measure each time the glucometer is used (mg/dL)
5.10 Check PXP glucometer for damage or blood before using.
5.10.1 Return meter to the lab if problems are noted.
5.11 If you hold the scanner for three seconds, the scanner stops.
5.11.1 Reposition the scanner and try again.
5.11.2 Never look into the scanner laser or point it toward anyone’s eyes.

5.14 The Precision PXP Glucose Testing system is designed for use with fresh whole
blood samples.
5.14.1 Do not use collection tubes that contain fluoride or oxalate.
5.14.2 The system is specific for D-glucose, other sugars do not react.
5.15 Extremes in hematocrit may affect the results.
5.15.1 Hematocrit range is from 20-70%
5.16 Test results may be lower if
5.16.1 severely dehydrated
5.16.2 severely hypotensive
5.16.3 in shock
5.16.4 hyperglycemic-hyperosmolar state (with or without ketosis)
5.17 Use proper capillary or venipuncture techniques
5.17.1 No water or alcohol is remaining on the puncture site
5.17.2 Excessive squeezing of the finger
5.17.3 It is best to wipe away first drop of blood from capillary collection
5.17.4 Incomplete clearing of the lines before collection
5.19 Always repeat test if results are not clinically expected and potentially
5.19.1 notify lab POC staff if initial results are inaccurate (from operator or specimen quality)
5.19.2 and/or perform laboratory assay if results are questionable, obtain a provider order
5.19.3 and/or follow glycemic protocols
5.20 Extremely high levels of the following substances do not affect results
5.20.1 uric acid 23.5 mg/dl
5.20.2 bilirubin 40 mg/dL
5.20.3 cholesterol 500 mg/dl
5.20.4 triglycerides 1500 mg/dl
5.20.5 maltose 110 mg/dL
5.20.6 Galactose 45 mg/dL
5.20.7 Acetaminophen 20 mg/dL
5.20.8 ascorbic acid 5 mg/dL
5.21 Xylose may produce falsely elevated glucose results during a xylose absorption test for diagnostic evaluation of malabsorption.
5.22 In run precision vary no more than 3.0 to 3.6% CV
5.23 Precautions before Using PXP Glucometer
5.23.1 Do not place PXP meter in liquid, or near where it could fall into liquid
5.23.2 Use the equipment only for the purpose described in the procedure.
5.23.3 Do not use accessories that are not supplied by Abbott
5.23.4 Do not use PXP glucometer if it is not working properly, or has suffered damage such as but not limited to dropping or dropping into liquid or splashing. Return to lab for replacement
5.23.5 Do not let the PXP glucometer come into contact with surfaces that are too hot to touch.
5.23.6 Do not use the PXP outdoors.
5.23.7 Do not insert anything into any opening or port of the glucometer.

6.0 Primary Sample System
6.1 Precision PXP Xceed Pro system is designed for use with fresh whole blood. The PXP system is not for testing serum or plasma samples.
6.2 Allow entire target area to fill with blood.
6.3 Do not re-apply blood to the strip if test does not initiate testing
6.4 After applying blood to the strip, do not touch the strip.
6.5 Obtain **capillary samples** with proper safety lancing device
   6.5.1 Follow proper fingerstick procedures and avoiding excessive squeezing.
   6.5.2 Best to wipe away first drop, use/test immediately
   6.5.3 **Hold the finger on the target area while the drop of blood is drawn into strip.** Strip uses 0.6 uL of blood to perform testing
   6.5.4 For neonate / heelstick collections allow a hanging drop of blood to form from the heel and apply to target area of strip. It is ok to gently touch the strip to the heel during application
   6.5.5 **Remove the finger when the test starts.**

6.6 Collect **venous samples** in either sodium or lithium heparin tubes.
   6.6.1 Do not use samples from oxalate or fluoride tubes.
   6.6.2 Mix samples gently before testing to insure uniform distribution, use a disposable transfer pipette to obtain blood from the tube.
   6.6.3 Test within 30 minutes of collection

6.7 Collect **arterial samples**
   6.7.1 Clear the arterial line before collecting blood sample from heparinized syringe.
   6.7.2 Allow drop to form at the tip of syringe to apply sample to strip.
   6.7.3 Test immediately, or mix well and test within 30 minutes of collection (delay is not recommended)

7.0 **Type of Container Additives**
   7.1 Use fresh whole blood not in a collection tube or container
   7.2 Collect venous samples in either sodium or lithium heparin tubes
   7.3 Use arterial blood collected in heparinized syringe

8.0 **Maintenance**
   8.1 Instruments must be kept clean and free of body fluids.
   8.1.1 **Cleaning of the glucometers is required daily, between patients, and when soiled.**
   8.1.2 Turn off the glucometer when cleaning.
   8.1.3 Use approved ammonia or alcohol based cleaners to clean
      8.1.3.1 Cavicide wipes are acceptable, follow instructions for use
   8.1.4 Do not use bleach or hydrogen peroxide based cleaners.
   8.1.5 Do not get moisture into the strip port or docking ports.
   8.2 Instruments must be checked for damage each time they are used.
   8.3 Check that the correct date and time are displayed when the meter is turned on and when results are displayed.
   8.4 Return meter to the lab if problems are noted.
   8.4.1 M-F day shift to POCT technologists
   8.4.2 Evening, night, weekends or holidays to Charge Tech
8.5 Red laser window must be kept clean in order to scan barcodes correctly.
8.6 PXP runs on two AA alkaline batteries.
  8.6.1 Display of battery life is in top right corner of PXP screen when glucometer is ON.
  8.6.2 Check battery voltage under MENU, Review Setup option #2, #2 System Status.
  8.6.3 Recommended voltage is 2.5 for optimum performance.
  8.6.4 See below for battery change instructions, turn meters OFF

**Battery change for SN starting with XP**
On back of meter, use tab to release the battery cover
Lift batteries out from the compartment, place new batteries in proper poles
Align battery cover at the back and snap tab into lock position

![Figure 1](image1.jpg)  ![Figure 2](image2.jpg)

**Battery change for SN starting with KC**
Press down FIRMLY on the battery cover at the finger grip area
Push to slide cover upward slightly, cover does not slide away from the meter
Lift cover up and away from meter as if hinged
Lift batteries out from the compartment, place new batteries in proper poles
Align battery compartment cover with slots on the meter, slide the cover in place

![Figure 3](image3.jpg)  ![Figure 4](image4.jpg)

9.0 **Calibration Procedures - LAB USE ONLY**
9.1 Calibration is checked with each scan of barcoded Xceed Pro test strip, based on the lot number.
9.2 Calibration Verification / Linearity is performed with Calibration and Linearity Kits upon installation of the meter.
9.3 Problems such as a major shift in QC, when major maintenance is performed, or as required by manufacturer or CAP may warrant repeating the linearity testing.
9.4 Procedure to perform linearity studies:
  9.4.1 1. Prepare vials of calibration verification material as described in the product insert.
9.4.1.1 Mix vials completely before testing.
9.4.1.2 Use all kits within expiration dates.
9.4.2 Press the Menu button
9.4.3 Select the #4 Linearity prompt
9.4.4 Enter operator ID and enter.
9.4.5 Scan or enter the Linearity lot # for the kit.
9.4.6 If New Panel screen appears choose either #1 ReEnter Kit Lot or #2 Replace Panel
9.4.7 Select the level of test to run.
9.4.8 The number to the right side will display the number of tests that have been run at the test level, PXP will allow up to 4 replicates of each level.
9.4.9 If you press #6 for a New Panel, the PXP will prompt to confirm that you wish to replace the existing panel.
9.4.10 Scan the strip lot #.
9.4.11 Open foil strip and insert electrode at the prompt.
9.4.12 At apply Level 1 prompt, place one drop of the well mixed vial of Level 1 solution to the target area.
9.4.12.1 Wait for testing to complete.
9.4.13 Remove electrode strip and select 2 for other replicates at the same level, or 1 for running a test at a different level.
9.4.14 When 4 replicates have been tested the level is considered full and will only display other level options.
9.4.15 Select other levels until all levels of reportable ranges have been run.
9.4.16 Press Menu button to return to Menu mode, or On/Off
9.4.17 Print linearity under Report Tab QCM3

9.5 Calibration verification is done with the
9.5.1 change of lot# of strips
9.5.2 or at 6 months
9.5.3 overall QC fails to meet criteria
9.5.4 or whenever major problems are encountered.
9.5.5 Calibration verification is performed with at least 3 levels (across the AMR or reportable range).
9.5.5.1 QC at three levels, or a low/mid/high level of the Calibration Verification kits can be used.

10.0 Quality Control Procedures
10.1 Quality control is performed on the Low, and High Precision PXP / Medisense Control Solutions.
10.1.1 Two levels of QC are required per instrument / per 24 hour.
10.1.2 QC is required on each lot in use.
10.1.3 QC requirements will be monitored and evaluated periodically, and adjusted QC ranges can be set in the QC Manager3.

10.2 QC solutions should be stored
10.2.1 from 39 to 86 F
10.2.2 between 10 and 90% humidity
10.2.3 do not freeze
10.2.4 keep tightly capped
10.2.5 and use within 90 days of opening
10.2.6 date when opened with the new expiration date
10.2.7 Solutions should be well mixed before using.

10.3 Lot numbers of QC solutions should be entered / scanned in the system when
10.3.1 Precision PXP does not accept QC that has passed its manufacturer expiration date, adhere to written expiration date
10.3.2 Scan barcoded lot# on QC vial to enter
10.3.3 Manual entry of lot# is acceptable if barcode is not readable

10.4 Follow procedure for Control testing
10.4.1 Turn the meter ON, Select #2 Control Test
10.4.2 Enter operator ID, press enter.
10.4.3 Scan or enter the Low Level Solution.
   10.4.3.1 If level other than the Low solution is scanned, the meter gives the option of Unexpected Level XXX Level entered, 1- ReEnter Lot or 2- Continue.
10.4.4 Scan barcode strip.
10.4.5 Open foil and insert strip at the prompt.
10.4.6 Apply well mixed QC solution to the target zone of strip at the prompt, tightly recap solution.
   10.4.6.1 Results in 20 seconds.

10.4.7 Results will display if PASS or FAIL, the barcoded strip contains the expected ranges
   10.4.7.1 If results FAIL, a comment code must be entered (use either the barcode for the comment code or the numeric code)
      10.4.7.1.1 Code 01 Repeat Test
   10.4.7.2 Repeat QC with a well mixed drop from same vial
   10.4.7.3 Try new vial of QC if FAILED twice from same vial
      10.4.7.3.1 Code 02 New Vial QC
   10.4.7.4 Contact the lab if QC fails repeatedly on original and new vials of in date QC
10.4.8 Select 1- Next level to go on to the next test.
10.4.9 Repeat above steps for High QC solution.
10.4.10 If QC is unacceptable, do not perform patient testing. Troubleshoot by the following
   10.4.10.1 check that no air bubbles are in the bottle tip
   10.4.10.2 calibrate system using barcode for the test strip used
   10.4.10.3 enter or scan for the correct level of QC
   10.4.10.4 check storage temperature of reagents, and humidity
   10.4.10.5 check WRITTEN expiration date on vials
   10.4.10.6 use new strip for each test

11.0 Procedural Steps
11.1 Use of the Precision PXP glucometer system falls under the federal guidelines for laboratory testing, and must comply with hospital and regulatory, and accreditation standards.
11.1.1 The glucometers are not to be used for patient assessments, but rather for physician order testing.
11.1.2 They are screening devices, used for monitoring not diagnosing.
11.1.3 The meters are laboratory instrumentation and fall under the direction and responsibility of the laboratory Medical Director.

11.2 Obtain fresh whole blood samples following PH collection procedures for venous, line draws, or capillary samples.
11.2.1 Venous collections must be sampled from a EDTA or heparinized tube with a disposable pipette within 30 minutes of collection.
11.2.2 Do not test venous bloods directly from collections.
11.2.3 Properly clear arterial lines before collections are obtained.

11.3 Each glucose screen test is to have a unique order in Cerner.

11.4 Follow procedure for patient testing:
11.4.1 Turn on meter, check date and time displays.
11.4.2 Select 1- Patient Test.
  11.4.2.1 Patient testing may only be performed on glucometer that has passed QC.
11.4.3 Enter operator ID by scanning badge barcode.
  11.4.3.1 Your operator ID must be defined in the PXP system with a current certification date in order to use the meter.
    11.4.3.1.1 **Operator not on List** will display on meter if ID does not have a current certification.
  11.4.3.2 Never use another operators ID.
  11.4.3.3 Never give your ID to another to use.
11.4.4 After properly identifying patient, operator should confirm that the patient is wearing the current valid armband for the facility and visit. Patient identification is performed by matching the full name and DOB on the armband with a source of patient identification. Scan the PH **Patient ID Link ARMBAND** for the glucose screen test for the **patient ID**. Barcode is the 10 digit account number.
  11.4.4.1 The **only way for the patient results to transfer automatically to the LIS and EMR is by use of the correct pt ID Link ARMBAND account number**.
11.4.5 For units with **TRUE ID** activated, the PXP will display (see PC1.014.03.F2)
  11.4.5.1 the patient name
  11.4.5.2 the patient ID number
  11.4.5.3 the patient DOB
  11.4.5.4 the patient sex
  11.4.5.5 prompt for the operator to enter the patient’s Year of Birth (2 digits) to CONFIRM this is the correct patient to be tested.
    (A)
  11.4.5.6 If the PXP does not display patient identification information

(A)  
(B)
(B) **Patient Data Not Found** is displayed

11.4.5.6.1 turn off and dock the glucometer to gain the latest ADT registration information
11.4.5.6.2 check patient account# is active
11.4.5.6.3 check patient registration information in computer
11.4.5.6.4 If patient ID is not found in the PXP, the glucometer will prompt the operator to **1- Re-Enter ID**
11.4.5.6.5 Upon re-entry of the patient ID#, the operator will be prompted to either
   11.4.5.6.5.1 **1-ReEnter ID**
   11.4.5.6.5.2 **2- Continue** to perform test
   11.4.5.6.5.3 **#2 Continue if ID is accurate**

11.4.6 If downtime for the ID Link system, you may use the patients 10 digit account # for pt identification.
   11.4.6.1 Follow Cerner downtime procedure Nursing orders.
11.4.7 Prep meter and perform proper collection
11.4.8 Scan the strip lot #.
   11.4.8.1 Never scan a lot# of strip and use another lot# strip
   11.4.8.2 Open foil packaged strip (use notch on side) and insert strip at the prompt.

**Scan or Enter Strip Lot**

**Insert Strip**

**Apply Sample**

11.4.9 At apply sample prompt place a drop of blood to the target zone.
   11.4.9.1 **Hold the strip to the blood sample until testing starts.**
   11.4.9.2 Allow target area to fill completely.
   11.4.9.3 Do not smear sample.
   11.4.9.4 **You may NOT reapply blood if test fails to start**
   11.4.9.5 Strip fills from top or side application. Do not fill from bottom of the strip
11.4.9.6 If the test fails to start, sufficient blood may not have been applied
   11.4.9.6.1 discard the current test strip
   11.4.9.6.2 repeat with new test strip

11.4.10 Results display in 20 seconds.
11.4.11 Results will display with the time and date, and pt ID
   11.4.11.1 Confirm that test date and time are correct
   11.4.11.2 Confirm that unit of measure is mg/dL

11.4.12 Results outside the reportable range will display as less than (<) or greater than (>).
   11.4.12.1 Reportable range for patient results is 45 to 450 mg/dL for adults, and 45 to 200 mg/dL for NICU and NBN.
   11.4.12.2 Patient test results above or below these levels are to be addressed by caregiver, provider, and/or protocol. Treat patient accordingly
   11.4.12.2.1 Confirmatory tests ordered as requested by provider (person authorized to place orders)

11.4.13 Results outside the Action Range limits will prompt for operator entry of coding
   11.4.13.1 Action Range limits are set per Nursing request
   11.4.13.2 Action Range <70 mg/dL
   11.4.13.3 Code 13 Physician Notified
   Code 09 Nurse Notified
   Code 18 Hypoglycemic Protocol followed

11.4.14 You will be prompted for 1 - Next Patient or 2 - Patient History
11.4.15 Dock meter promptly for results to file to pt EMR, LIS

11.5 If the blood glucose result appears to be inconsistent (lower or higher than expected), there may be a problem with the test strip or blood sample.
11.6 Results that are incorrect may have serious medical consequences.
11.7 Consult the order set or prescribing physician before making any changes to diabetes medication plans if:
   11.7.1 The blood glucose results are not consistent with the physical symptoms AND you have ruled out common errors in technique. Collection technique can affect results

12.0 Reference Intervals
12.1 Fasting Normal 70-99 mg/dL
12.2 Impaired 100-125 mg/dL
12.3 Random 70-140 mg/dL

13.0 Alert and/or Critical Values
13.1 The PXP Glucometer system does not report panic / critical results

14.0 Glucometer Configuration
14.1 Meters are programmed within the PXP System for options with
   14.1.1 operator identification and certification,
   14.1.2 meter QC and QA,
   14.1.3 upload requirements,
   14.1.4 and strip lot numbers.
14.2 Meters are set with programming options before they are issued to the units, and each
time they are docked the information in the meter itself is updated to reflect current status of the QCM3 Manager database.

14.2.1 Operator certification

14.3 The Precision PXP System will allow you to review any of the data stored in the instrument.

14.3.1 You must be a valid user to access the stored data.

14.3.2 Patient data can be retrieved with the following options

- Patient by OperID
- Patient by PatID
- All Patient data
- Control Data
- Proficiency Data
- Linearity Data

14.3.3 To review data

- go to the MENU button,
- select #1 Data Review,
- Enter your Oper ID#, 
- Choose category to review

14.3.4 Press Clear to return to the MENU mode.

15.0 Downloading of PXP Glucometers

15.1 The Precision PXP System offers an optional docking station or cable that provides a means for hands-free automatic data transfer upload/download between the Precision PXP Monitor and a PC running the QC Manager3 application software.

15.2 The docking station or cable must be plugged into a networked PC, with the Medisense DataRepeater software installed.

15.2.1 The DataRepeater software should be “connected” and remain so continuously.

15.3 PXP Meters should be placed in the docking station when turned OFF, and will upload automatically when first placed in dock/ or cable connector.

15.3.1 The meter will indicate downloading with the Abbott logo first, the arrowed rotation and the message “Please Wait Data Uploading”.

15.3.2 “Upload Successful meter Turning OFF” is displayed briefly when complete.

15.3.3 If meter does not display the arrowed rotation and “Upload” message, then

- check that the networked PC is ON
- hardboot the PC and try docking again
- check that the docking station is not physically damaged
- that PH is not experiencing Network connectivity issues
- After completing the above troubleshooting, you may contact IT helpdesk or POC techs

15.3.4 If the meter is removed from the docking station before the upload is
complete, then no information will transfer, and potential meter programming may be lost (i.e. operator list).

15.3.4.1 The information will complete in the next docking/upload transmission.

15.3.5 If problems occur in the data upload, a display error message will appear on the monitor, refer to the troubleshooting section.

15.4 PXP glucometer should be turned OFF before docking.

15.5 The docking station is not a charger.

15.6 The PXP meter docks when initially place in docking station, it does not continuously docking.

16.0 Entry of Results

16.1 Once the PXP glucometer is docked, results will post

16.1.1 in the LIS

16.1.2 in the EMR (Cerner)

16.1.3 other interfaced systems

17.0 References:


17.2 Abbott PXP Plus Blood Glucose Test Strip and Quality Control Products Inserts, Rev. 2009/2010

17.3 Abbott Precision Xceed Pro Configuration Guide (MeterCom for Precision Web with SP4), Abbott 6/2007


17.5 American Diabetes Association Clinic Practice Recommendations: Diagnosis and classification of diabetes mellitus, Diabetes Care 2005: 28 (supl) 537-542


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Revised 10.25.12
PC1.014.04.F2 PXP GLUCOMETER / Xceed Pro Glucometer Strips
# Minimum Specimen Requirements for Pediatrics

*Most Commonly Ordered Tests*

*Note: These requirements apply to patients with a normal hematocrit.*

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Whole Blood Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Amylase</td>
<td>0.5 mL Red Microtainer</td>
</tr>
<tr>
<td>Ammonia</td>
<td>2.0 mL Green (Lithium Heparin) on ice delivered to lab immediately</td>
</tr>
<tr>
<td>Bilirubin Direct</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Bilirubin, Fractionated</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Bilirubin, Total</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>CO2</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Chloride</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Digoxin</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>1.8 mL Blue (Full)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>1.0 mL Plain Red Microtainer</td>
</tr>
<tr>
<td>Glucose</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Hepatitis A Total</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Hepatitis A IgM</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Hepatitis B Core IgM</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Hepatitis B Surface Antigen w/ Confirmation</td>
<td>4.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Hepatitis C Antibody w/ reflex</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Hepatitis Acute Panel</td>
<td>4.5 mL Red Microtainer</td>
</tr>
<tr>
<td>HIV Antibody</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>IgA</td>
<td>1.0 mL Red Microtainer</td>
</tr>
<tr>
<td>IgE</td>
<td>1.0 mL Red Microtainer</td>
</tr>
<tr>
<td>IgG</td>
<td>1.0 mL Red Microtainer</td>
</tr>
<tr>
<td>IgM</td>
<td>1.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Iron/TIBC</td>
<td>1.0 mL Pediatric Red Tube</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>2.0 mL Gray on ice</td>
</tr>
<tr>
<td>LDH</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>0.5 mL Plain Red Microtainer</td>
</tr>
<tr>
<td>Lipase</td>
<td>0.5 mL Red Microtainer</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Osmolality</td>
<td>1.0 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Osmolality, Urine</td>
<td>0.5 mL Urine</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>0.5 mL Plain Red Microtainer</td>
</tr>
<tr>
<td>Phenytoin (Dilantin)</td>
<td>0.5 mL Plain Red Microtainer</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>1.0 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Potassium</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Renin</td>
<td>3 mL Lavender</td>
</tr>
<tr>
<td>Salicylate</td>
<td>0.5 mL Plain Red Microtainer</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>TEST NAME</td>
<td>REQUIREMENTS</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Theophylline</td>
<td>0.5 mL Red Microtainer</td>
</tr>
<tr>
<td>Total Protein</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>1.0 mL Red Microtainer</td>
</tr>
<tr>
<td>TSH</td>
<td>2.0 mL Red Microtainers (2)</td>
</tr>
<tr>
<td>Urea Nitrogen</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Uric Acid</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>1.0 mL Plain Red Microtainer</td>
</tr>
<tr>
<td><strong>CHEMISTRY PANELS</strong></td>
<td></td>
</tr>
<tr>
<td>Electrolytes - Na, K, Cl, CO2</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Basic Metabolic Panel (BMP)</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Renal Panel(RENAL)</td>
<td>0.5 mL Red or Green Microtainer</td>
</tr>
<tr>
<td>Comprehensive Metabolic Panel(CMP)</td>
<td>1.0 mL in a Red tube or 2 full red Microtainers</td>
</tr>
<tr>
<td>Lipid Profile</td>
<td>2.0 mL in a Red or Green (Lithium Heparin)</td>
</tr>
<tr>
<td>FT4 or T4 ordered with TSH</td>
<td>2.0 mL Red Microtainer</td>
</tr>
<tr>
<td>Drug Screen Urine</td>
<td>1.0 mL Urine (minimum requirement)</td>
</tr>
<tr>
<td><strong>BLOOD BANK</strong></td>
<td></td>
</tr>
<tr>
<td>Direct Coombs</td>
<td>1.0cc Purple Cone</td>
</tr>
<tr>
<td>Indirect Coombs</td>
<td>1.0cc Red Cone</td>
</tr>
<tr>
<td>Type &amp; Rh (pt less than 4 mos old)</td>
<td>1.0cc Purple Cone</td>
</tr>
<tr>
<td>(pt greater than 4 mos old)</td>
<td>1.0cc Purple Cone</td>
</tr>
<tr>
<td>Crossmatch (pt with no history of transfusion)</td>
<td>1.5cc in 2ml Pink tube Pediatric Red Top Tube acceptable.</td>
</tr>
<tr>
<td>(pt with history of transfusion)</td>
<td>5.0cc in 6ml Pink tube, RedTop Tube acceptable</td>
</tr>
<tr>
<td><strong>IMMUNOLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>RPR</td>
<td>1.5 mL Red Top</td>
</tr>
<tr>
<td><strong>COAGULATION</strong></td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Full 1.8 mL Blue</td>
</tr>
<tr>
<td>PTT</td>
<td>Full 1.8 mL Blue</td>
</tr>
<tr>
<td>PT/PTT</td>
<td>Full 1.8 mL Blue</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>Full 1.8 mL Blue</td>
</tr>
<tr>
<td>DDI</td>
<td>Full 1.8 mL Blue</td>
</tr>
<tr>
<td>AT III</td>
<td>Full 1.8 mL Blue</td>
</tr>
</tbody>
</table>

**TEST NAME**

**WHOLE BLOOD REQUIREMENTS**

**HEMATOLOGY**
<table>
<thead>
<tr>
<th>Test</th>
<th>Tube Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBG</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>HCT</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>HGB/HCT</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>Platelet Count</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>WBC</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>CBC with diff</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>CBC</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>Retic Count</td>
<td>0.5 mL Lavender Microtainer</td>
</tr>
<tr>
<td>Sed Rate</td>
<td>2.0 mL Lavender Tube</td>
</tr>
<tr>
<td>(Microtainers are not acceptable)</td>
<td></td>
</tr>
</tbody>
</table>

**MICROBIOLOGY**

<table>
<thead>
<tr>
<th>Test</th>
<th>Tube Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directigen - Single Antigen</td>
<td>1.0cc Red Pediatric Tube</td>
</tr>
<tr>
<td>Directigen-Full Panel</td>
<td>1.5cc Red Pediatric Tube</td>
</tr>
<tr>
<td>Blood Cultures Routine</td>
<td>BacTAlert Adult Set 8 - 10cc per vial (optimal)</td>
</tr>
<tr>
<td></td>
<td>BacTAlert Pediatric Vial 1 - 3cc (optimal)</td>
</tr>
<tr>
<td>Fungal/AFB</td>
<td>Isolator Tube 1.5cc - Pediatric (under 35lbs)</td>
</tr>
<tr>
<td>HIV-1 Screen</td>
<td>1.0cc Red Top</td>
</tr>
</tbody>
</table>

**SEND OUT**

<table>
<thead>
<tr>
<th>Test</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine Viral Isolation</td>
<td>5.0 mL Urine</td>
</tr>
<tr>
<td>CMV Urine</td>
<td>5.0 mL Urine</td>
</tr>
<tr>
<td>Chromosome Studies</td>
<td>3.0 mL Sodium Heparin Green Tube</td>
</tr>
<tr>
<td>Amino Acid Quant Plasma</td>
<td>3.0 mL Sodium Heparin Green Tube</td>
</tr>
<tr>
<td>Metabolic Screen</td>
<td>5.0 mL urine</td>
</tr>
<tr>
<td>Amino Acid Quant, Urine</td>
<td>5.0 mL urine</td>
</tr>
</tbody>
</table>
ECMO ORDERS/NUMBERS

All pre-ECMO labs are drawn from a line for a total of 9cc of blood withdrawn. The infant should be stuck for anything from this point on.

1-2 mL Red Top or Green Top (Lithium Heparin) Tube:
CA
Creatinine
Basic Metabolic Screen
ALT (SGPT)
Fractionated Bilirubin
LDH
Alkaline Phosphatate

1 mL Red Microtainer:
Phenobarbital
Gentamicin Level
Fibrinogen 1.8 mL Blue Top Tube
PTINR * 1.8 mL Blue Top Tube
PTT* 1.8 mL Blue Top Tube
D-Dimer 1.8 mL Blue Top Tube
*Both tests may be performed on one sample.

Initial ECMO Blood Charge
1 u. CMV NEG RBC’s
2 u. FFP
1 u. CMV-Plt Pheresis
250ml. 25% Albumin

Blood Culture 1-3cc Pediatric Bactec Vial

CLINICAL GUIDELINES FOR OBTAINING MICROBIOLOGICAL STUDIES (Including Viral and Rickettsial Diseases {DHEC Laboratory})

It is important that culture specimens be processed as soon as possible after collection to ensure survival and isolation of fastidious organisms. Prompt delivery is needed to provide accurate diagnosis of the infectious-disease process. DELIVER ALL SPECIMENS IMMEDIATELY.

If for some reason there is a delay in transport, specimens should be handled in the following manner:

Refrigerate Incubate 35 °C or Room Temperature
Urines CSF
Stools Other sterile body fluids
Respiratory exudates Blood specimens
Wounds Genital/Cervical for Gonococcus
All other sites

Specimens that may harbor temperature sensitive organisms such as Neisseria species should be left at room temperature. Use transport media.
For anaerobic specimens, tissue and/or body fluids (in syringe without needle attached) are the ideal specimen of choice. These samples should be received in Micro lab within 2 hours of collection. **We strongly discourage use of any type of swab** (limited amount of sample) **for anaerobic isolation**.

Specimens physicians collect using needle aspiration should be transferred to a sterile tube or anaerobic transport vial prior to transport of the specimen to the laboratory. If the amount is small, a small amount of non-bacteriostatic 0.85% NaCl or broth may be drawn into the syringe prior to removal of the needle. Remove the needle using a protective device and replace with a sterile cap prior to transporting to the lab.

**REJECTION**

Although the primary responsibility of the bacteriology lab is to accept specimens for routine culture and carry out the requested test on them, there are times when it is necessary to reject a specimen. Some possible reasons for rejection are as follows:

1. The specimen is not labeled with the patient’s name, hospital number and source of specimen.
2. The specimen is in a non-sterile container.
3. Prolonged delay in transporting specimens.
4. Specimen not adequate for the test requested.
5. Specimen collected incorrectly or stored incorrectly upon arrival in the lab.
6. Specimen collected in such a way as to contaminate the container and make handling hazardous for laboratory personnel.
7. Duplicate specimens on same day for same request should not be processed. (Exception: blood cultures)
7. Specimens in formalin

**FEVER WITHOUT APPARENT CAUSE:**
Culture may need to be obtained on patients with an unexplained fever and on patients with findings consistent with sepsis, including unexplained shock, hypothermia, leukopenia, or intravascular coagulation. Two blood cultures and one urine culture prior to initiation or therapy are usually adequate. If indicated, nasopharyngeal and/or CSF cultures should be obtained. If diarrhea is present, or if the fever has persisted more than five (5) days, stool cultures should be obtained.

**ENDOCARDITIS:**
Six blood cultures collected prior to initiation of therapy are recommended. If all six are negative and endocarditis is still suspected, consultation should be obtained. **EACH CULTURE REQUIRES A SEPARATE VENIPUNCTURE.** Bacteremia should be obtained at this time.
MENINGITIS:
Adequate microbiological studies require a minimum of 2 ml of CSF. If more is available, it should be submitted. Many organisms found in CSF are fragile, and prompt culturing is essential. **CSF SPECIMENS FOR CULTURE SHOULD NOT BE LEFT FOR ROUTINE SPECIMEN TRANSPORT.** All CSF samples are cultured and tests are considered stat. They should be brought to the lab immediately.

URINARY TRACT INFECTION:
One or two clean catch or one catheterized or suprapubic urine specimen should be obtained prior to initiation of therapy. If septicemia is suspected, two blood cultures should be obtained. An additional culture to evaluate antibiotic efficacy may be obtained 48 hours after initiation of therapy. In the absence of underlying anatomical pathology, the presenting pathogen should be cleared rapidly; microbial persistence suggests that relapse would be likely without change of antibiotics or correction of any anatomical problem. Follow-up cultures one or two weeks after completion of therapy is useful to document cure. Proper preparation of the patient prior to collecting the specimen and immediate transport is essential to obtain accurate colony counts. Specimen collection should be noted and specimens should be forwarded to the laboratory or placed in the automated tube system for transport. A most undesirable routine is the batching of cultures on the nursing units to be transported to the laboratory at the change of shifts.

PNEUMONIA:
A single sputum specimen prior to initiation of therapy is adequate in most situations. It is essential that sputum rather than saliva be submitted. **A SPUTUM SHOWING NO OR RARE WBCS, MODERATE OR MANY EPITHELIAL CELLS (> or = 25/lpf) WILL RESULT IN INACCURATE AND MISLEADING INFORMATION.** Therefore, these specimens will be rejected based on the Gram stain results. The floor is notified. A good sputum specimen should then be collected for re-submission. Nasotracheal, transtracheal or nasopharyngeal cultures should be obtained if sputum is not being produced. The source of the specimen should be indicated on the request slip. Throat cultures are rarely helpful. If indicated by the patient’s clinical condition, two blood cultures should be obtained prior to starting treatment. If cultures for tuberculosis, and/or fungi are required as well, washing should be collected for culture and the request slip should indicate the source of the specimen. Copious sputum may be produced 4-8 hours after bronchoscopy; this is an excellent source of material for culture.

LUNG ABSCESSES:
For anaerobic cultures, use tissue and/ or body fluids (We strongly discourage use of swabs (culturettes for anaerobic culture). Deliver specimen promptly to Microbiology lab.

BACTERIAL PHARYNGITIS:
A single throat culture obtained with “Culturette” swab is adequate. If infection with beta hemolytic streptococci is suspected, the “Strep Screen” should be requested. If organisms other than Group A beta hemolytic streptococci are suspected, this should be noted in the specimen description so appropriate media will be used. If diphtheria is suspected, the laboratory should be notified immediately so that special culture media can be obtained. Immediate consultation with a member of the infectious disease group is imperative.

BACTERIAL ENTERITIS:
A single stool specimen or rectal swab is usually adequate for the diagnosis of acute **SALMONELLA or SHIGELLA** infections. Only 1 specimen should be sent per patient per 24hrs
without prior consultation. There is very limited yield provided by additional specimens. In the rare instance when a **Salmonella** carrier state is suspected, several cultures should be obtained at weekly intervals. If staphylococcal or fungal enterocolitis is suspected, a Gram stain should be requested. Also, the suspected organism should be indicated in the specimen description section in the computer. Test stool for Clostridium difficile toxin for all patients over 6 months of age with clinically significant diarrhea and a history of antibiotic exposure. Consider C. difficile testing as an alternative to routine microbiologic studies for inpatients over 6 months of age who have tests requested for routine enteric pathogens. **DO NOT PERFORM** routine stool cultures for patients whose length of hospital stay is >3 days and the admitting diagnosis was not gastroenteritis without consultation with physician. Test for **C. difficile** should be considered for these patients. Comprehensive stool culture includes Salmonella, Shigella, E. coli O157:H7, and Campylobacter. Isolates may also be requested separately. Yersinia or Vibrio must be requested separately if indicated. **Salmonella** & Shigella may be ordered under routine stool culture.

**SKIN INFECTIONS:**

Materials should be obtained using “Culturette” swab from the advancing edge of the lesion or from the pus if furuncles are present. If streptococcal cellulitis is suspected and no pus is present, the lesion may be injected with sterile saline without preservative, followed by aspiration to obtain material for culture. The request slip should indicate the type of infection so appropriate media will be used in the laboratory; this particularly important for decubitus ulcers. Culture of the debrided necrotic tissue is generally not useful.

**PERITONITIS, EMPYEMA OR PYARTHROSIS:**

The fluid aspirated should be injected into sterile screw-topped tubes. The request slip should indicate the source of material. If the amount of material is small, the syringe may be brought to the laboratory **after** the needle has been removed.

**GONORRHOEA CULTURE:**

Materials should be collected from the genital lesions using two separate swabs. One swab should be taken into the laboratory immediately with request slip requesting “GC Culture”. The second swab should be used to make a smear for Gram staining. Specimens from other sites, such as blood or joint fluid, should be taken to the laboratory immediately after collection. A comment should indicate that gonococci is suspected. Because gonococci are fragile organisms, direct inoculation of media obtained from Microbiology may enhance the yield. Stool and throat specimens maybe collected for GC culture. The source should be indicated in the computer.

**CHLAMYDIA CULTURE: SEND OUT TEST**

Specimens should be collected as early in the infection as possible. It is essential that epithelial cells be collected in conjunctival and genital specimens. Vigorously swab or scrape the area after removal of the exudate. The transitional zone of the cervix should be sampled. Sputa or throat washings are suitable for respiratory infection. Use the supplied swab and place the specimen in the M4 **transport medium** obtain from sendout. Transport immediately to the laboratory. Transport the inoculated transport medium on ice.

**HERPES CULTURE: SEND OUT TEST**

Specimens should be collected from the site of infection as soon as possible after disease onset. The specimens of choice is vesicular fluid aspirated from the fresh (not crusted) lesions with a 26 or 27 gauge needle in a tuberculin syringe. Expel fluid immediately into **viral transport medium**. When lesions are not visible, premoisten the supplied sterile swab with viral transport medium, abrade the area briskly to obtain cellular material. Replace swab transport medium. Cut the excess length and
securely fasten the cap. Transport immediately to the laboratory. Transport the inoculated viral transport medium in ice.

**LEGIONELLA: SEND OUT TEST**
Acceptable specimens include: CSF, serum (5ml), urine, transtracheal aspirates, sputum, bronchial washing, lung tissue, and pleural fluid. Place sample on ice and send to Microbiology lab immediately. All specimens are sent to DHEC for processing. If delay is greater than 48 hours, freeze specimen.

**MICROBIOLOGY SPECIMEN REQUIREMENTS:**

**Blood (Broth Bottles):** Place 8-10 ml of blood in each adult bottle. Pediatric collection requires 1-4 ml of blood. Each culture should be taken by separate venipuncture. Do not inoculate multiple blood culture sets from single venipuncture and do not draw blood through angiocaths, stopcocks, or other equipment if it can be avoided. REFER TO BACT ALERT BLOOD COLLECTION PROCEDURE FOR PROPER COLLECTION INSTRUCTIONS.

**Bronchoscopy:** Place washings in sterile, tightly capped tube. Any BAL specimen for quantitative culture should be clearly marked to ensure proper culture processing is performed.

**Cerebrospinal Fluid:** Prep the skin with iodine and allow to dry. Wash with alcohol. Lumbar puncture should then be performed by physician. Place at least 2 ml of CSF in a sterile, screw-top tube, note collection date and time on specimen with appropriate label and bring to laboratory immediately.

**Ear - External:** Use transport swab system as directed on package. Clean outer ear with alcohol prep before collecting. Smears are not performed on these specimens.

**Ear - Middle:** Aspirate into syringe and place in sterile test tube.

**Eye:** Use transport swab system as directed on package.

**Fluids:** Send at least 2 ml in sterile, screw-top tube.

**Gastric Washings or Lavage:** The patient should fast prior to this collection procedure. It is best to perform as soon as the patient awakes in the morning and before they eat. Three consecutive gastric specimens are superior to a single aspiration. It is preferable to use commercially prepared sterile distilled water for parenteral injection to avoid introducing saprophytic acid-fast organisms which may be present in tap water. Since gastric contents are toxic to tubercle bacilli, specimens should be processed IMMEDIATELY after collection. These specimens are processed only Monday thru Friday. The Microbiology Lab must be notified prior to collection.

**Nasopharyngeal “Calgiswab”** - Place in tube of holding medium or “Culturette.” DO NOT USE “Calgiswab for RSV Collection or Bordetella pertussis PCR testing. (Use DACRON or POLYESTER swabs for these tests.)

**Sputum:** Use special, sterile, plastic container. Have patient cough. Do not collect saliva. Do not collect 24 hour specimens. Bring to laboratory as soon as possible. Gram stain will be done to access proper quality.

**Throat:** Use transport swab system as directed on package.
**Tissue:** Use sterile, screw-top jar. Add sterile saline to keep moist if necessary.

**Urine:** Clean catch, catheterized, or suprapubic urine specimens are recommended. (Refer to Urine Collection Procedure.)

**Wound:** Use transport system as directed on package.

**Stool:** Send a small stool specimen in a plastic stool collection cup (not paper) container. A “Culturette” swab in transport medium may be used if stool is unobtainable, unless multiple tests are ordered. Do not accept specimens for Ova and Parasite or culture from in-patients after the third hospital day.

**Urethra:** Transport swab system as directed. If GC is suspected, please order “GC Culture.”

**Beta Hemolytic Streptococci:** Transport swab system as directed. Order “Culture-Throat, Strep A Screen”.

**Gonorrhea:** Transport system is a must if not plated directly to media. Order “G.C. Culture.” Available also for throat and stool cultures.

**Epidemiological Cultures:** These will be accepted only after approval. Cultures by the Chairman of the Infectious Disease Committee and by the Medical Director of Microbiology Section.

**Special Microbial Isolates and Procedures including Brucellosis, Leptospirosis, Mycoplasma, Pneumocystis, Tularemia, Cell Wall Defective Organisms, Bordetella Pertussis (Whooping Cough), Acanthamoeba Keratitis, Actinomycosis, Nocardiosis, Schlicter Test (Serum Bactericidal Level):** Because of special media and differences in processing necessary to achieve maximum recovery, if the diseases listed are suspected, call the Clinical Lab Supervisor of the Microbiology Section (ext. 7623) or the pathologist (ext. 6405) before collection of the specimen.
ACCESSING LAB RESULTS THROUGH CERNER

To view Lab results, choose your selected patient to open the patient record, click on the Flowsheet Tab, then choose either the Lab-Rad or Lab View specialty flowsheet. These default to a clinical range of 8 days of results to view. There are 3 choices of views for these specialty flowsheets: Table, Group, or List views. The Table View gives the Test Name and Results in vertical columns. The Group View shows each component result of a test (i.e. CBC) in a horizontal view, making it easy for comparisons of previous results. The List view has columns for the test name, actual results, and the normal reference range which makes it easy to see how out of range the result might be.

Document notification of significant high's, low's, and panic labs to the physician by going to Ad Hoc charting and choosing the Notifications-Consults form. This form includes a grid to fill out. Under the Regarding column, choose Labs and the give details in the Comments section. There is also a column for Notification Response.

**IF YOU HAVE ANY QUESTIONS CONCERNING THIS PROCEDURE, CONTACT IT (Information Technology) ON EXTENSION 4357**

Effective Date: 3/1/2011

Q1.018.07 PANIC VALUE / CRITICAL NEED TESTS

1.0 Policy Statement
Panic values are results that warrant immediate attention due to potential life threatening consequences. Tests that are deemed critical (life or death) in nature by the provider or caregiver based on the patient clinical condition can be ordered as CRISIS priority and delivered to the lab.

2.0 Guidelines
2.1 Reporting Panic / Critical results
2.1.1 All results are reviewed by the resulting tech before being accepted in the LIS.
2.1.2 The Laboratory Computer System (LIS) will flag panic values as “failed verify” in most cases, some Blood Bank and Microbiology codes are exceptions in the LIS but are defined in procedures.
2.1.10 Panic values are determined by the Technical Supervisor, Pathologists, and physicians with the aid of clinical references.
2.1.11 Panics may be reflected by the reference lab when test is not performed on site.
2.1.11.1 These results will be called and documented by Send Out (SO) department upon releasing the results daily.
2.1.11.1.1 Sunday’s Core Lab Charge Tech will be responsible for calling results received after SO department closes on Sat and results received day shift on Sunday.
2.1.12 Specimen characteristics are noted on the report where appropriate.
2.1.13 Panics by ordering location:
2.1.13.1 Inpatient panic values are called to the M.D., charge nurse or nurse assigned to the patient.
2.1.13.2 Outpatient panic values are called to the M.D. or nurse at the physicians’ office.
2.1.13.3 Out Reach panics are called to the client as soon as possible according to the agreements by their Medical Director and PHR Laboratory.
2.1.14 Panic results are called to the appropriate individual immediately upon resulting with exceptions as outlined above for Outreach and SO.
2.1.15 Do not give results to the answering service or leave on answering machines.
2.1.16 Have the person receiving results read back the panic value to verify accuracy to include
   2.1.9.1 Full name and MR# of patient
   2.1.9.2 Test name
   2.1.9.3 Panic result with units of measure
2.1.10 Note the last name of the person receiving results and the time the results were called in the computer next to the associated panic value.
2.1.13 At the discretion of the Senior Tech, the pathologist may be notified.
   2.1.13.1 Results indicated an unusual condition
   2.1.13.2 Results are questionable
   2.1.13.3 Tech is unable to contact responsible party
2.1.14 Any attempts to notify the appropriate person of critical results must be documented in the computer.
   2.1.14.1 The section supervisor should be notified of failure to contact an appropriate person to take the result and action should be taken to prevent recurrence of the communication problem

2.2 Critical Need Tests
2.2.7 If patients are in life or death situations, test may be ordered under CRISIS priority.
2.2.8 Labs will be ordered under CRISIS priority in Cerner.
2.2.9 Samples will be hand delivered to the laboratory and given to the charge tech who will be responsible.
   2.2.9.1 If the sample cannot be delivered to the lab, a call can be made to the supervisor or charge tech to alert that the sample(s) will be tubed to the lab.
   2.2.9.2 Supervisor or charge tech will go to the tube system immediately to retrieve the sample(s).
2.2.10 Samples will be logged into the CRISIS lab log book
2.2.11 Tests will be run and resulted as soon as possible before any other testing, with a goal of less than 15 minutes TAT.
2.2.12 Crisis test results will be called.

2.3 Reportable Disease Reporting
2.3.1 PHR will comply with all state and national reportable disease notification listings.
2.3.2 Results that require notice within 24 hours will be reported to the ordering physicians.
2.3.3 Results that are to be reported within 7 days will be sent to DHEC.
2.3.3 All qualifying results will be reported to DHEC

2.4 Significant or Unexpected Surgical Pathology Findings
2.4.1 When the Pathologist discovers significant or unexpected surgical pathology findings they will immediately notify the submitting physician as indicated, either by telephone or pager. Findings may include, but are not limited to
2.4.1.1 unexpected malignancy
2.4.1.2 discrepancies between frozen sections diagnosis and permanent section findings
2.4.1.3 significant findings on special stains
2.4.2 This notification is documented as a comment in the surgical pathology report.

3.0 **Palmetto Health Richland Policies**
3.1 Critical Test Results, Communication of

4.0 **Initial Date of Policy**
   12/12/1992
   Revised 7/19/02
   Revised 10/9/07
   Revised 2/5/09
   Revised 3/30/09
   Revised 2/8/2010
   Revised 3/1/2011
PNEUMATIC TUBE TRANSPORT

1.0 PRINCIPLE
To ensure the safe and timely transport of blood and urine specimens to and from the laboratory. Specimens that are difficult to replace (i.e. CSF and other body fluids should not be sent to the lab via the tube system.) Rare exceptions are made for the point to point system. Fluids must be carried to the Core Lab and logged into the Body Fluid Book.

2.0 EQUIPMENT:
2.1 Transport carriers (color coded)
2.2 Biohazard bags
2.3 Foam inserts

3.0 PROCEDURE:
3.1 Collect specimen in approved container. Urine must be in a container with screw top cap tightly sealed.
3.2 Identify specimens correctly with the computer generated label or follow back up procedures.
3.3 Place specimens in the self-seal bag and securely close. These bags are not reusable.
3.4 Paperwork should be placed in the outside pocket of the bag to prevent contamination.
3.5 Red carriers with foam liners are to be used with all Lab specimens except:
   3.5.1 Blood products use green carriers.
   3.5.2 Point to point system uses yellow carriers.
   3.5.3 ER Pods use green/grey carriers.
   3.5.4 Pharmacy uses black carriers.
   3.5.5 ER uses yellow carriers.
   3.5.6 STICU uses blue carriers.
3.6 Green carriers used to send blood products do not have foam liners.
3.7 Towels and paper items may not be substituted for foam lined carriers.
3.8 Open carrier by pressing outward on the clips at both ends of carrier.
3.9 Close carrier firmly—both latches must close.
   3.9.1 Carriers that are too heavy and/or too full may open in transport.
   3.9.2 This can result in closing the whole tube system down to find and remove the carrier.
3.10 Insert carrier into the send station, select station and push “send”.
3.11 NOTE: Notify Engineering immediately when a spill occurs. All specimen spills require enforcement of Infection Control and Universal Precaution policies.
4.0 REFERENCES:


4.2 National Committee for Clinical Laboratory Standards: NCCLS M29-T2
4.3 National Institutes of Health, Department Bio-Safety
4.4 Center for Disease Control Hospital Infection Control Program

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TIMED URINE COLLECTION
Palmetto Health Richland
ENGLISH FORM

HOW TO COLLECT SPECIMEN
1. Empty bladder at the start of collection and discard the urine. Write the start time and date on this form.
2. From the start time on, collect all urine and pour into the provided container. If more than one container is needed, obtain from the laboratory and continue collection in the new container. Do not interrupt urine collection. Refrigerate the container(s) until it is transported to the laboratory.
3. Continue to collect urine until the designated end date and time. Empty your bladder and include this specimen in the collection container. Write this time and date on this form.
4. Bring the specimen to the laboratory as soon as possible after termination of collection.

ALL INFORMATION BELOW MUST BE COMPLETED TO ENSURE PROPER PROCESSING

TO BE COMPLETED BY PATIENT OR NURING STAFF

DATE STARTED______TIME STARTED_______DATE ENDED______ TIME ENDED_______

PATIENT HEIGHT:______(centimeters) PATIENT WEIGHT _________(kilograms) # Containers_____

(Inches times 2.54 = cm) (Pounds divided by 2.2 = kg)

PERSON COMPLETING FORM _______________________________________________________

TO BE COMPLETED BY LABORATORY STAFF

PATIENT NAME ____________________________ MR#________________________ ROOM # ________

TESTS ORDERED (ensure they are entered into the computer) __________________________ Dr.____________________

Laboratory Staff completing form:____________________ Date container given________________________
RECOLECCIONES DE ORINA CRONOMETRADAS...CÓMO RECOGER LA MUESTRA:

1. Desocupe la vejiga antes de recoger la muestra y deseché la orina.

2. De este momento en adelante recoja toda la orina y viértala en este recipiente. (Si necesita otro recipiente, obténgalo del laboratorio y continúe. No interrumpa la recolección de orina y comience de nuevo. Es muy importante recoger toda la orina dentro del tiempo especificado.) Mantenga el recipiente refrigerado hasta que sea llevado al laboratorio.

3. Siga recogiendo la orina hasta el punto final designado. En ese momento desocupe su vejiga e incluya esta muestra en el recipiente recolector. Anote la hora y fecha en esta solicitud.

4. Lleve la muestra al laboratorio tan pronto haya terminado de recogerla completamente.

TODA LA SIGUIENTE INFORMACIÓN DEBE SER DILIGENCIADA ANTES DE PROCESAR UNA MUESTRA.

A SER DILIGENCIADO POR EL PACIENTE O EL PERSONAL DE ENFERMERÍA. (POR FAVOR LLENE TODOS LOS ESPACIOS EN BLANCO):

FECHA DE INICIO_________________HORA DE INICIO____________FECHA DE TERMINACIÓN_________________HORA DE TERMINACIÓN_________________

ESTATURA DEL PACIENTE_________cm   PESO DEL PACIENTE____________Kg   NÚMERO DE RECIPIENTES____________

NOMBRE DE LA PERSONA QUE DILIGENCIABA EL FORMATO:

A SER DILIGENCIADO POR EL PERSONAL DEL LABORATORIO: Personal del Laboratorio

Nombre:________________________________________

Nombre del Paciente: __________________________________________ #ID_________________________________ Habitación___________

Exámenes Ordenados:________________________________________Dr.___________________________________

Fecha del recipiente